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Pea coal, chestnut, small stove or coke may be used as fuel in the Excelsior Ranges. These ranges are made in all sizes from a little 15½ inch single oven range to a big double oven range with a top over five feet long and two ovens each 18 x 20 inches. All sizes are made for either horizontal or vertical boilers and all single oven ranges are made right or left hand. There is no range want that cannot be met in the Excelsior Range line.

ISAAC A. SHEPPARD & CO.
NEW YORK PHILADELPHIA BALTIMORE

Nothing first-rate gets used by the common run of mechanics or anybody else. There is always some plausible reason against it—galvanized iron, for instance.

American Sheet Steel Company
New York

A COAL dealer told one of our customers if he would quit handling STEWART STOVES in that town, he would buy one. He bought one any way. Reasons are obvious.

GREAT FUEL SAVERS are P. P. STEWART STOVES.

FULLER & WARREN CO., Troy, N. Y.
This Ad. changes every issue.

NOTICE.

Silver, Nickel Platers and Brass Goods Mfrs. MATERIAL FOR DRYING PURPOSES.
Write for prices to John Sommer's Son, 355-365 Central Ave., Newark, N. J.



CROSBY SPRING-SEAT
GLOBE and ANGLE VALVES, IRON and BRASS.
All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.
Crosby Steam Gage & Valve Co.,
BOSTON: 95 Oliver St. NEW YORK: 78 John St. CHICAGO: 21 23 W. Lake St.



FOLLANSBEE BROTHERS CO.,
328-330-332 Second Ave.,
Pittsburgh.
Galvanized and Black Sheets.

We wish our friends and customers a Prosperous and Happy New Year, and hope they will remember we manufacture Tin Plate.

Philadelphia, 133 Arch St.
Chicago, 504 N. Water St.
Louisville, 7th and Magnolia.

Steam Specialties.

RELIEF and ELEVATOR VALVES, STEAM TRAPS, STEAM AND WATER REDUCING VALVES, NOISELESS BACK PRESSURE VALVES, PUMP GOVERNORS, STEAM and OIL SEPARATORS. TANK TEMPERATURE CONTROLLER and A No. 1 DAMPER REGULATORS
KIELEY AND MUELLER,
9-17 W. 13th St., - NEW YORK.

JENKINS IMPROVED AUTOMATIC AIR VALVES.



Suitable for high or low pressure. Take no more room than an ordinary air cock. Endorsed by the leading steam experts as the best made and the quickest working. All genuine stamped with our Trade Mark.
JENKINS BROS., New York, Boston, Chicago, Philadelphia.

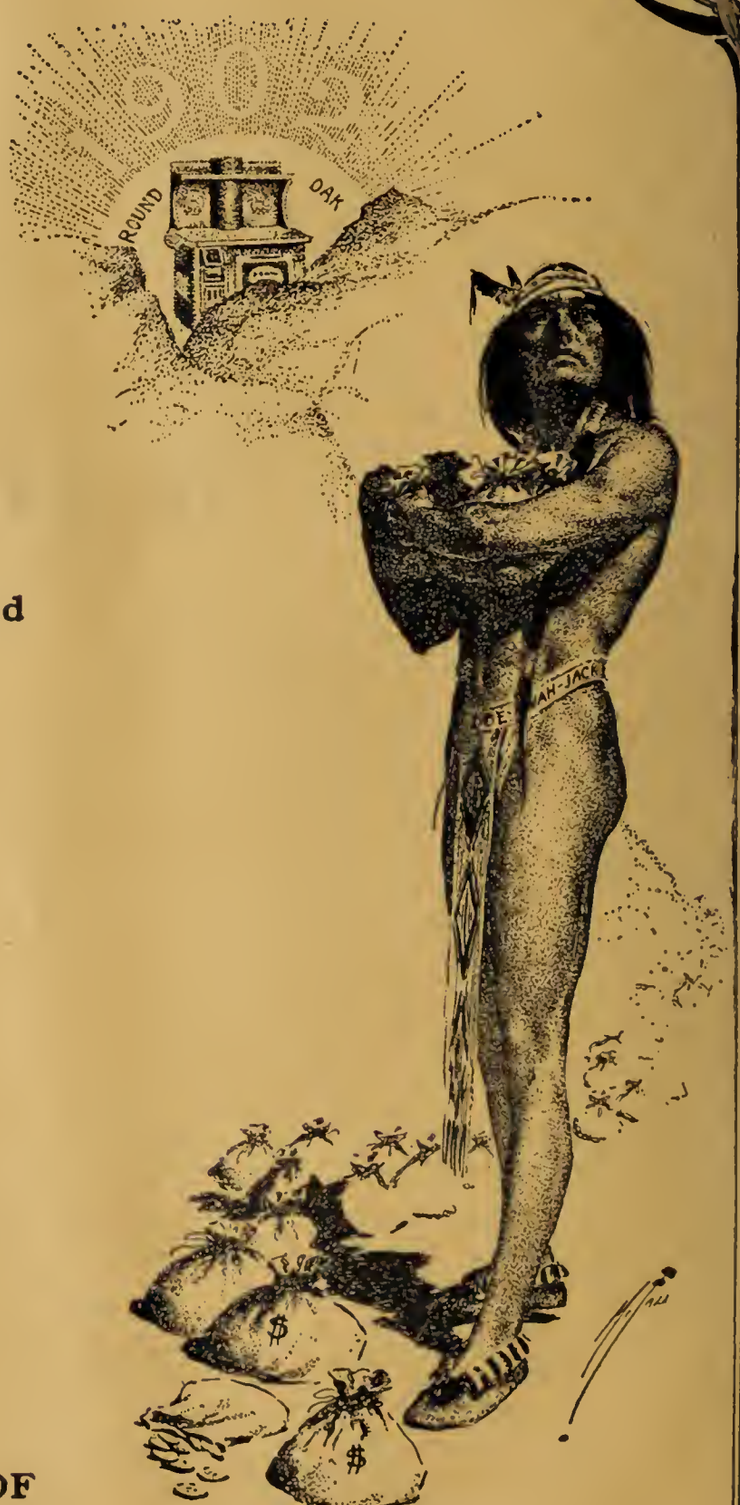
READ OUR "AD" Page 8.
MAGEE FURNACE CO.,
Boston.

ROUND OAK
STANDARD of AMERICA

Why not

among other
good resolutions
for the New Year
make one
about carrying
too many different
kinds of ranges?
Why not concentrate
your efforts on the
Round Oak Steel Range and
Round Oak Standard
Cast Range?
Persistent, continuous,
hard work, with a
good range
to back you up will

show the most profit at the end of the year.



You will not get returns,
however, unless you work,
no matter how good
we make our ranges.
New catalogue ready
about March 1st.

ESTATE OF

P. D. BECKWITH, Dowagiac, Mich.

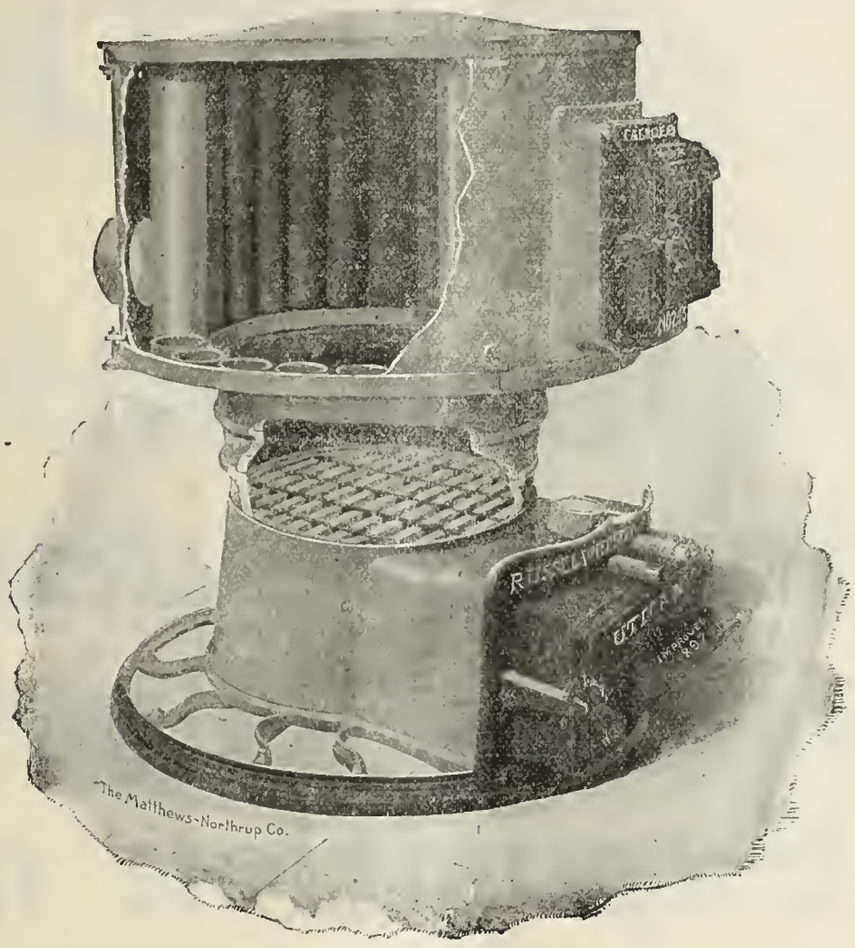
MAKERS OF GOOD GOODS ONLY

HB CHICAGO

Attractive Windows, Attentive Clerks, Display Ads.
These are Trade Getters.
But they do not Compare with the Free Advertisement
Given by Pleased Customers—Sell Good Goods.

Palace Queen

WARM AIR FURNACE.



A peculiarly efficient heater of original design. The arrangement of wrought iron tubes and large combustion spaces secures

REMARKABLY EFFECTIVE
RADIATING SURFACE.

Convince Yourself.

International Heater Co.,

UTICA, N. Y.

BOSTON. **NEW YORK.** **CHICAGO.** **DENVER.**



GAR
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ANOTHER

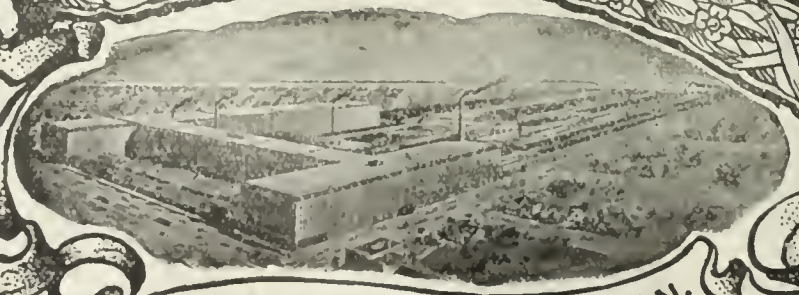
"Garland" Sto awarded First P Gold Medal at t Exposition of 190

First Prize

The Michigan S

Largest makers of Stov

DETROIT. CH



WORKS AT DETROIT, MICHIGAN.

LAND
VES
ND
GES
rld's Best"



First Prize Paris, 1900.

VICTORY.

ves and Ranges
rize and the only
he Pan-American
I.

Paris, 1900.

Stove Company,
s and Ranges in the World.
ICAGO. BUFFALO.



WESTERN HEADQUARTERS. CHICAGO.

The "Standard" Wickless

BLUE FLAME OIL STOVE.

FOR COAL, OIL OR GASOLINE.

TIME TRIED; it has been in successful use for four seasons and has proven an unqualified success.



It lights quickly, the flame is easily controlled. No joints to leak, is absolutely safe. It is the original and most successful Wickless Oil Stove. For simplicity, safety and perfect operation, is unexcelled.

The following well known jobbers have sold the "Standard" Wickless from its beginning. They recommend it. That guarantees it.

EASTERN JOBBERS.

F. M. BORDEN & BRO., Philadelphia, Pa.

EUGENE MUNSELL & CO., New York, N. Y

THE S. M. HOWES CO., Boston, Mass.

SOUTHERN JOBBERS.

W. B. BELKNAP & CO., Louisville, Ky.

THE NORTHWEST.

FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.

PACIFIC COAST STATES.

HOLBROOK, MERRILL & STETSON, San Francisco, Cal.

DOMINION OF CANADA.

THE THOS. DAVIDSON MFG. CO., · · Montreal, Quebec.

WESTERN JOBBERS.

COOK & VAN EVERA CO., Chicago, Ill.

MORLEY BROS. · Saginaw, Mich,

TOWNLEY STOVE CO., Terre Haute, Ind.

F. TIEMANN STOVE & HDWE. CO., St. Louis, Mo.

TOWNLEY METAL CO., Kansas City, Mo.

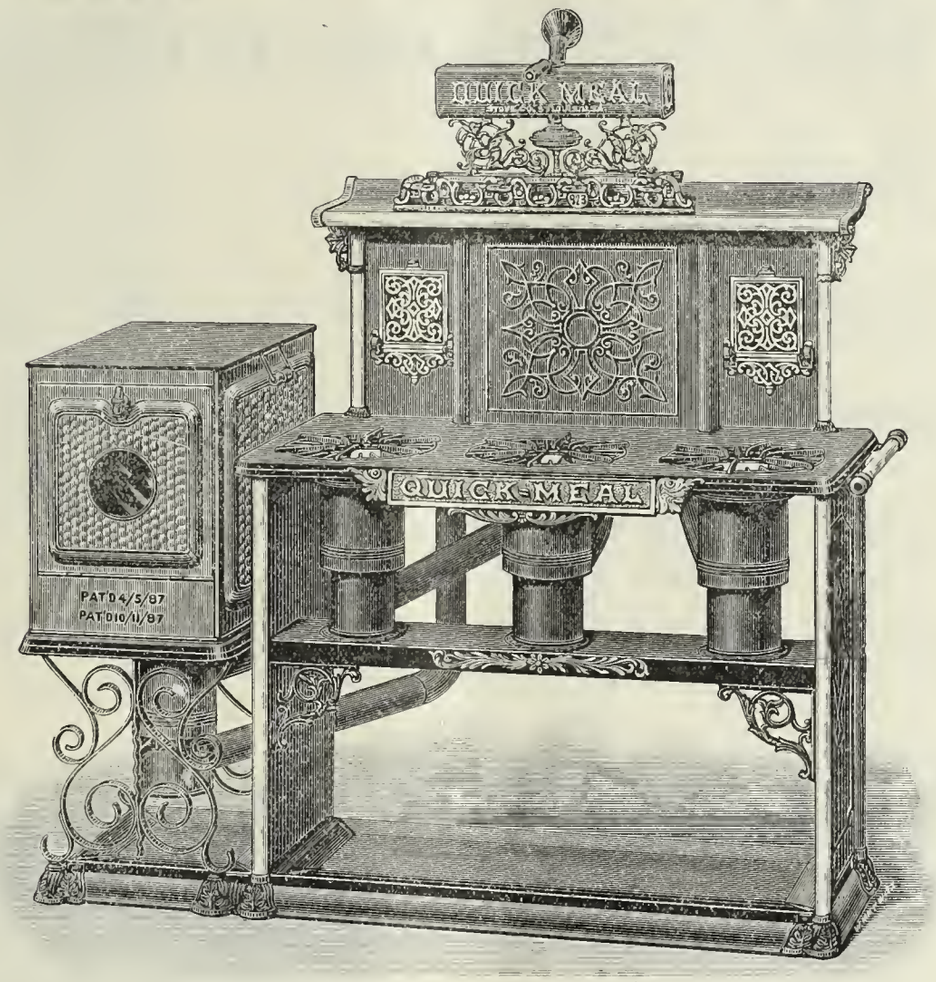
A. C. RAYMER, Omaha, Neb.

M. P. BORDEN STOVE CO., Denver, Col.

THE STANDARD LIGHTING CO., Cleveland, Ohio.

QUICK MEAL

Gasoline Stoves.



"QUICK MEAL" Gasoline Stoves are used in all parts of the World. Their **Name** is synonym of **Perfection.** Their appearance attracts attention. The simplicity of their parts and the workmanship-like manner in which they are made makes it easy for the operator to understand them, easy to regulate, easy to keep clean, and easy to repair.

The dealer who sells the "Quick Meal" makes friends, gives his customers a Gasoline Stove they can't help understand how to handle and one that will bake and cook as well as a range or cook stove. Now is the time to secure the agency for the coming season.

RINGEN STOVE Co. SAINT LOUIS

"Whitewash is CHEAP, but not lasting."

Start the New Year right. Isn't now the time to select your line for future business

A LINE which will aid you in making money is worth knowing about. We have such a line and we will gladly explain the "Magee Idea" to anyone interested.

MAGEE FURNACE CO.,

32-38 Union Street, BOSTON.

Steam and Hot Water Heaters, Combination Warm Air and Hot Water, Warm Air alone, Ranges, Stoves, Etc.

Largest Line Under One Name in the United States.

BRAND STOVE CO.

STOVES, RANGES and FURNACES.

SEND FOR CATALOG.

MILWAUKEE. WIS.

LADD'S DISCOUNT BOOK.

A practical means of rapidly reaching absolutely accurate results without the mental wear of computing.

It gives at a glance the net of any sum at a great range of discounts, simple and complex, and it is accurate, rapid and practical. Price, $3.00; Double Indexed Edition, $4.00.

Mailed, post-paid, upon receipt of price by DAVID WILLIAMS COMPANY, 232-238 William St., New York.



1802 — 1902

..Note.. the Difference.

There is relatively just as much difference between the

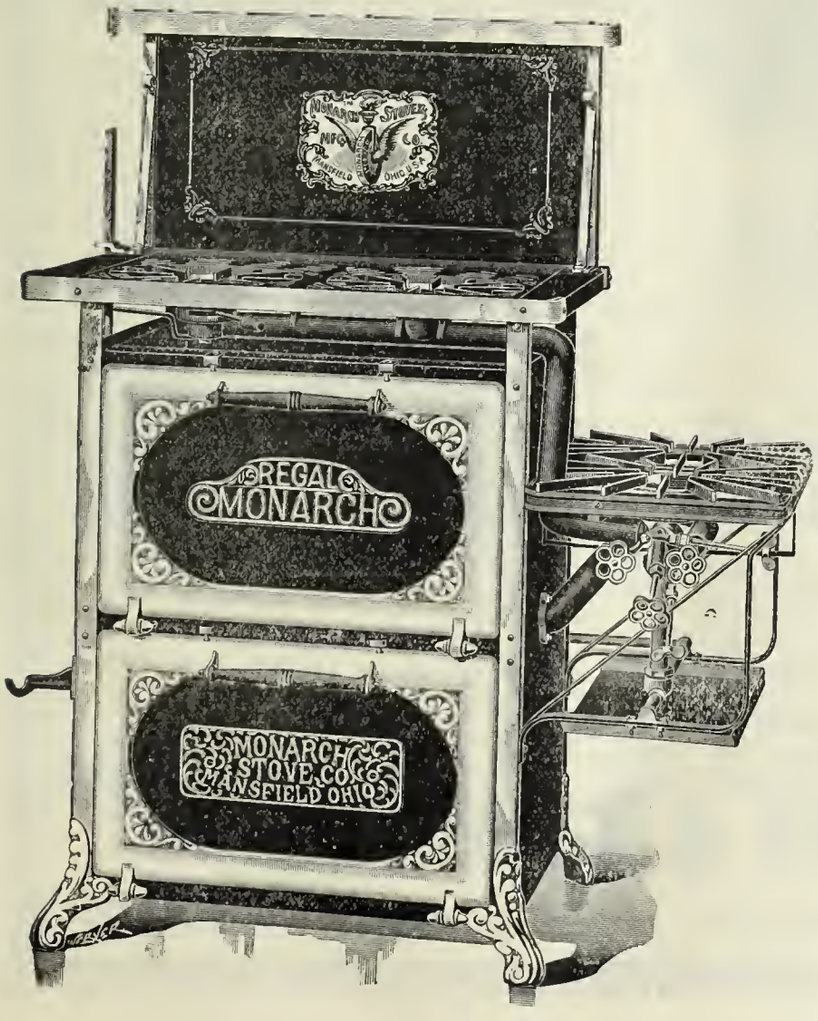
MONARCH LINE

and other makes.

Our line to-day is first and foremost in point of Excellence, Beauty, Finish and Practicability.

DEALERS

Make no error in handling this line for 1902 of Vapor and Oil Stoves and Asbestos Lined Ovens, as they, once shown, practically sell themselves. Write now to us direct or any of our Agencies. Your communications will have prompt attention, and be sure to get a copy of our new Catalogue.



THE MONARCH STOVE & MFG. CO.,

MANSFIELD, O.

BRANCHES.

284-6 Pearl St., N. Y. 67 Lake St., Chicago.
107 N. 2d St., Phila. 191 Eagle St., St, Paul, Minn.
203 Wood St., Pittsburg.

H. R. BRUCE & CO., Agents,

419 Pike Bldg., Cincinnati, O.

RELIABLE

Vapor Stoves and Ranges.



We have added several new patterns of Vapor Stoves and Ranges to our already large line for 1902, and in the future, as in the past, they will be beyond the reach of all competition. Dealers who handle the **RELIABLE** line invariably control the vapor stove business of their city. They never disappoint the user. Each stove sold will sell another! Testimonials of dealers who have handled them bear witness to their profit-making qualities.

Dealers should write us for a copy of our 1902 Vapor Stove Catalogue. Free for the asking.

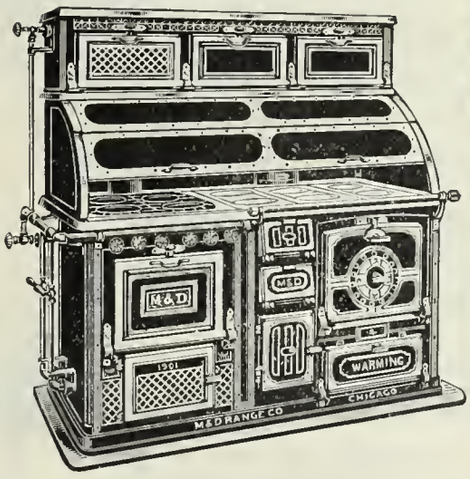
THE SCHNEIDER & TRENKAMP CO.

CLEVELAND CHICAGO SAN FRANCISCO



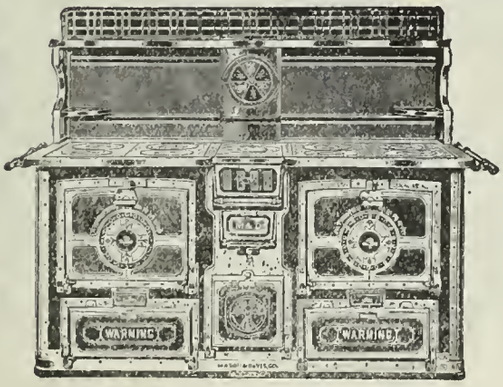
M&D STEEL RANGES.

BEST ON EARTH.



The United States Government uses our heavy Hotel Ranges on its War Vessels.

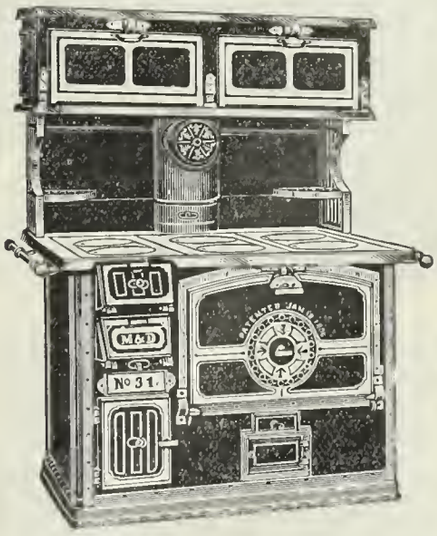
Combination Ranges for Coal or Wood and Gas.



DOUBLE OVEN RANGES
ALL SIZES.

We build the largest line of Steel Ranges in the world.

Write for Catalogue and Discounts



M & D RANGE CO.,

96-98-100 LAKE STREET, CHICAGO.

Mention THE METAL WORKER.

JEWEL STOVES AND RANGES..



A Complete, Well Advertised Line;
Low Prices and Good Workmanship.

Please Write for Catalogue.

DETROIT STOVE WORKS.

Detroit - Chicago.



CATALOGUES SHOWING

GAS RANGES
CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS

WILL BE FURNISHED FOR THE ASKING BY

Enterprise Stove Co., VINCENNES, IND.

All Cast Iron Double Radiator.



Quality First

IS THE PRINCIPLE FOLLOWED

In the Manufacture of

MUELLER

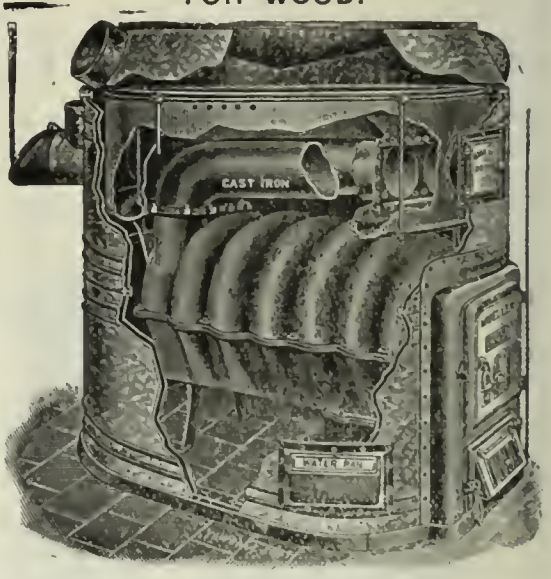
Furnaces and Boilers.

Made in all Styles—For all Kinds of Fuel.

Get Our Special Register Offer.

EVERYTHING IN THE HEATING LINE.

FOR WOOD.



190 Reed St., L. J. MUELLER FURNACE CO., Milwaukee, Wis.



WINCHESTER

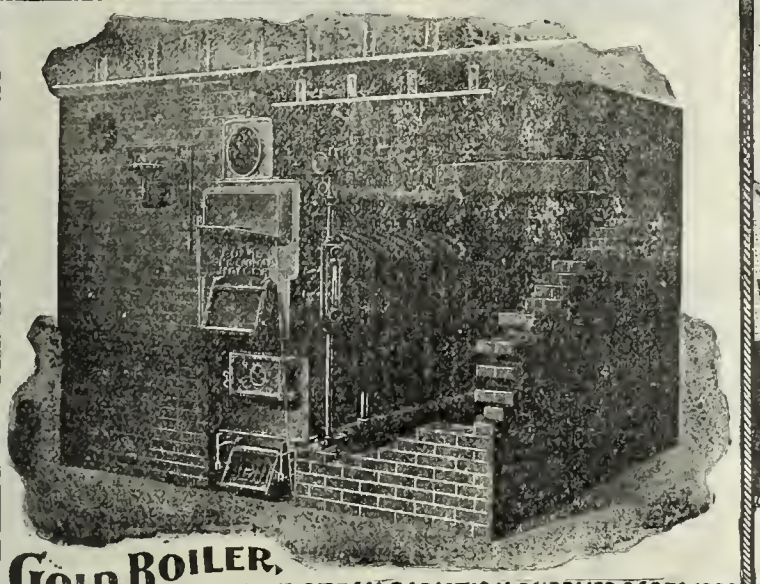
How often success in man or goods is ascribed to "luck" We all know better. Intelligence, ability, diligence and merit make for success and not for failure Do you suppose the "WINCHESTER" steam or water heater would have proved the success it has if it were merely "lucky"? Made by Smith & Thayer Co., Boston, Mass.

HEATER.



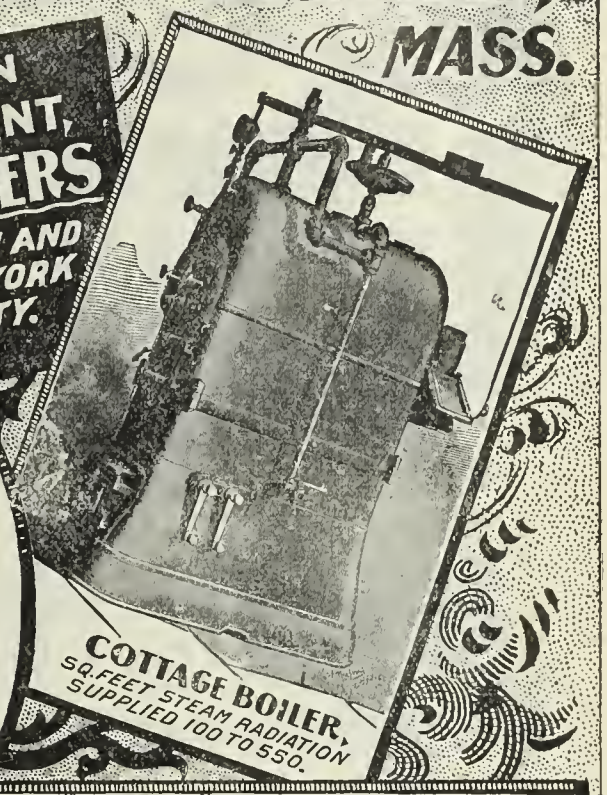
THE H.B.SMITH CO.

WESTFIELD, MASS.



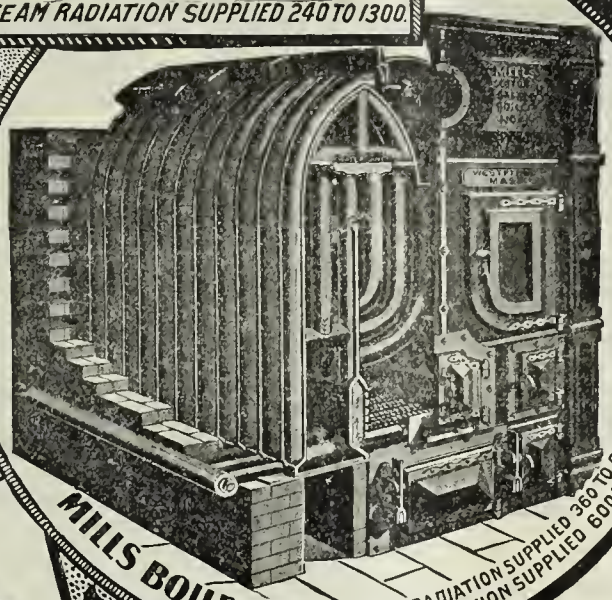
GOLD BOILER,
SQ. FEET STEAM RADIATION SUPPLIED 240 TO 1300.

EUROPEAN AGENT,
AUG. EGGERS
BREMEN AND NEW YORK CITY.

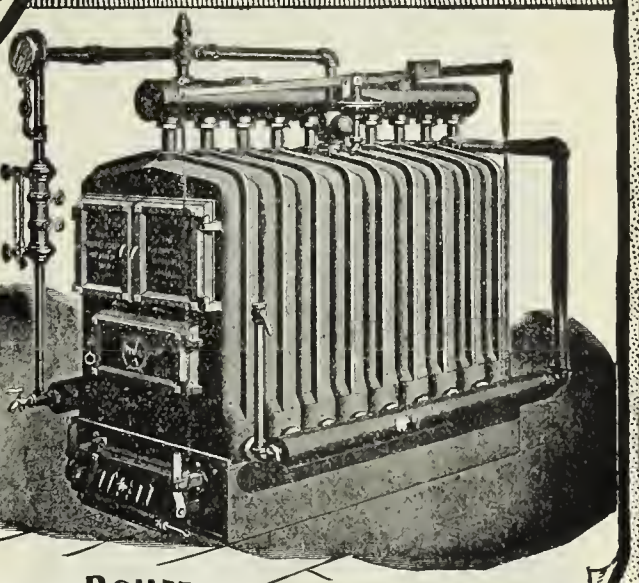


COTTAGE BOILER,
SQ. FEET STEAM RADIATION SUPPLIED 100 TO 550.

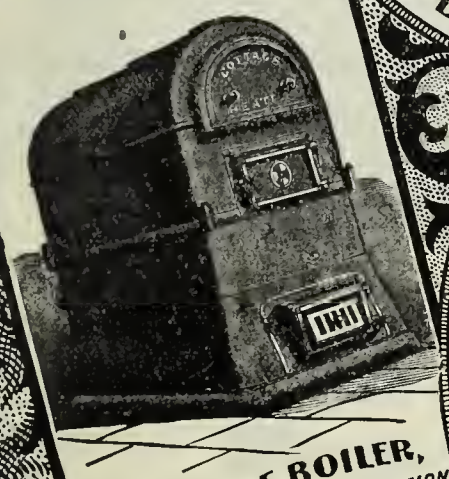
PACIFIC COAST AGENTS,
DUGAN BROS.
SAN FRANCISCO CAL.



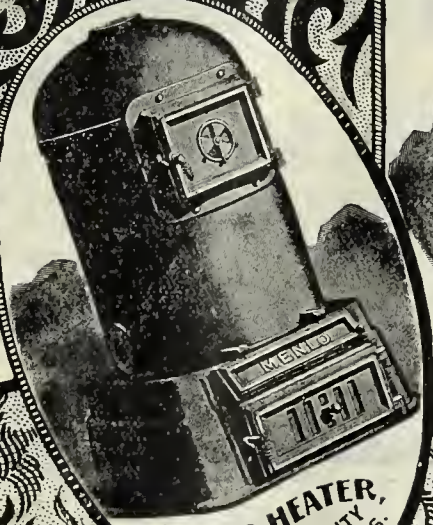
MILLS BOILER, SQ. FEET STEAM RADIATION SUPPLIED 360 TO 6250.
SQ. FEET WATER RADIATION SUPPLIED 600 TO 10400.



MERCER BOILER,
SQ. FEET STEAM RADIATION SUPPLIED 300 TO 3500.



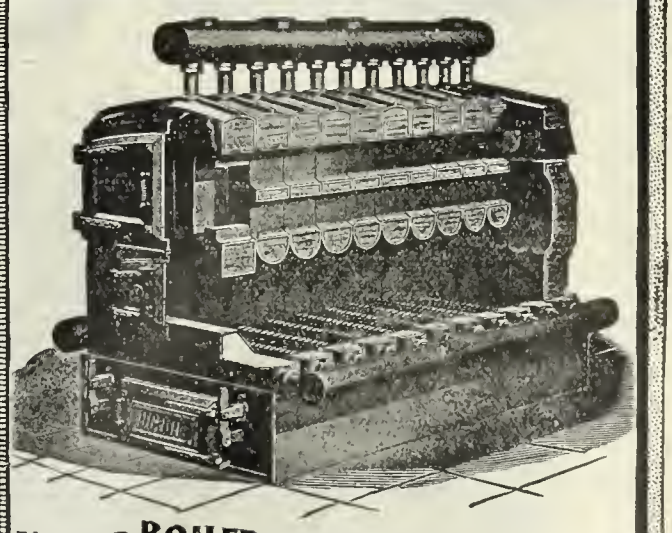
COTTAGE BOILER,
SQ. FEET WATER RADIATION SUPPLIED 150 TO 1000.



MENLO HEATER,
TANK CAPACITY,
100 TO 180 GALLONS.

Western Agents
WESTERN BRASS MFG CO.
ST. LOUIS, MO.

SALESROOMS:
133 CENTRE ST., NEW YORK CITY.
510 ARCH ST., PHILADELPHIA, PA.



MERCER BOILER,
SQ. FEET WATER RADIATION SUPPLIED 500 TO 5800.

Royal Heaters.

MANUFACTURED BY THE

HART & CROUSE Co.

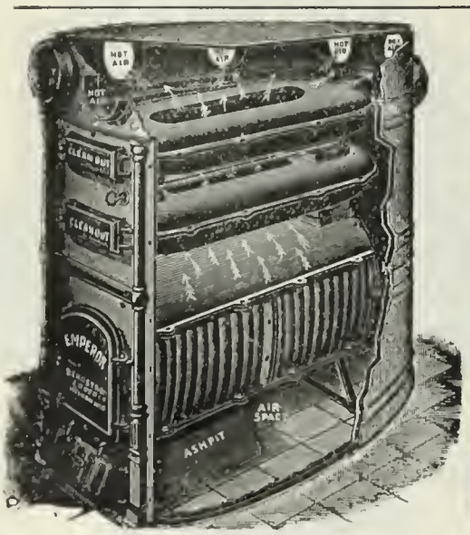
UTICA, N.Y.

ALL THE LEADING LINES OF

STEAM, HOT WATER & HOT AIR,

FOR HEATING ALL CLASSES OF BUILDING.

235 WATER ST., N.Y. BRANCHES. 79 LAKE ST., CHICAGO.
COLUMBUS., O. ST. LOUIS.



Emperor Furnaces

FOR WOOD.

Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces. . . .
Furnished for either Brick or Galvanized Iron Casing.

SEND FOR CATALOGUE.

Bergstrom Bros Co

NEENAH, WIS.

The Stanton Seamless Heater,



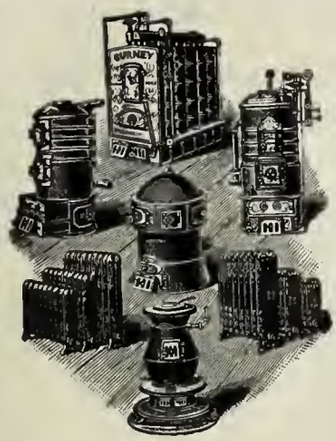
PORTABLE CASED.

The cut herewith represents the ***Stanton Seamless Heater complete***, with portable casing. The inside Casing Sheet is made of ***No. 24 cold rolled sheet steel.*** The outside casing is made of ***No. 24 Aluminum-coated sheet steel,*** which is anti-rust and will stand a much higher degree of heat than it will ever be subjected to before tarnishing. Heavy asbestos paper is placed between inside and outside casing, which prevents heat from radiating into cellar. ***This coating will not peel off,*** but remain pretty and white.

SEND FOR CATALOGUE.

THE STANTON HEATER CO.,
Martin's Ferry, Ohio.

See Our Advertisement Next Week.



Gurney Heaters

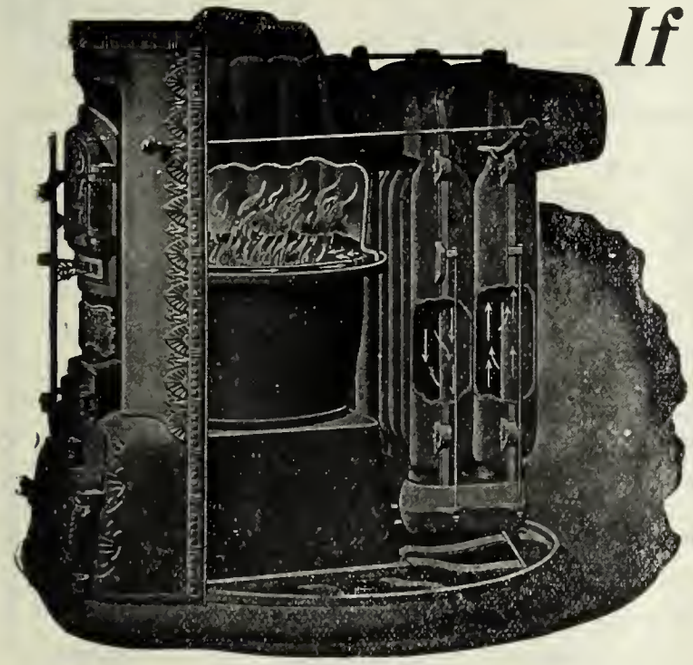
Provide every advantage a heater can provide,—the very best material, the most durable and approved construction, insuring the greatest efficiency from the least possible consumption of fuel.

CAPACITIES FULLY GUARANTEED.

Don't you wish to handle the BEST? Send for our latest trade catalogue.

GURNEY HEATER MFG. CO., 74 Franklin Street, Boston.
111 Fifth Ave., New York City.

Western Selling Agents, JAMES B. CLOW & SONS, 222-224 Lake St., Chicago, Ills.



Eastern Selling Agents,
GURNEY & CO.,
Washington, Hanover and Elm Sts., BOSTON, MASS.

If It's a Question

of coal consumption or heat production, we can aid you and give you some points worth thinking about.

THE BENGAL FURNACE

burns less fuel and produces more heat than any other furnace its size.

WRITE FOR OUR BOOKLET.

SECURE A BENGAL AGENCY AT ONCE.

FLOYD, WELLS & CO.,
ROYERSFORD, - - PA.

WE HAVE IT

A VERTICAL SECTIONAL STEAM HEATER

WITH A

Steady Water Line

We absolutely guarantee our Henderson Thermo Steam Heater to work with a steady water line with any reasonably good system of piping.

The Prizer-Painter Stove & Heater Co.,

READING, PA.

IF you are not sure what size Furnace to use, tell us the conditions and we will advise you just what size "DIGHTON" will do the work and answer any particular questions you may wish to ask as to size and arrangement of pipes and Registers.

No. of Furnace.	Diameter of Fire Pot.	Height of Castings.	Diameter of Casings.	List Price of Castings.	List Price of Casings.
19	20 Inches	51 Inches	36 Inches	$40 00	$8 00
21	22 "	53 "	39 "	48 00	9 00
23	24 "	51 "	42 "	60 00	11 50
25	26 "	53 "	46 "	70 00	14 00
28	29 "	60 "	52 "	100 00	17 00
30	31 "	62 "	52 "	125 00	17 00

A whole lot of people have written us about how much they paid for a ***name*** and how little the name was really worth to them when the ***goods*** didn't do the work, and how much better and more satisfactory in every way and how much less fuel the "DIGHTON" required to heat the same space.

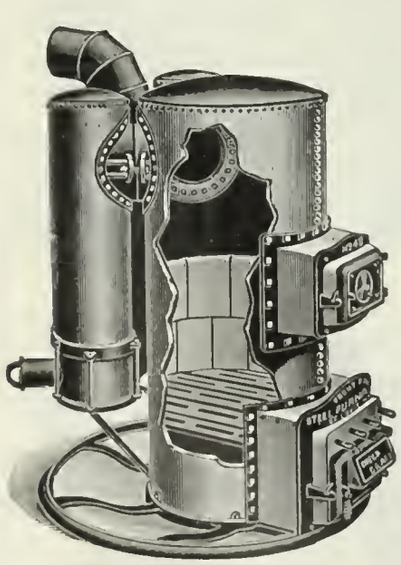
DIGHTON FURNACE CO., TAUNTON, MASS.

Your Guarantee is Good,

If backed up by our line. We make many kinds and sizes of steam and hot water boilers, and you as a dealer ought to know all about this line. Let us send you our printed matter and post you on the standard line. Write to-day.

KEWANEE BOILER COMPANY

KEWANEE, ILLS.



Front Rank Hot Air Furnaces

are built on vertical lines; air comes in direct contact with entire heating surface.

The Front Rank Fire Chamber is one solid sheet of closely riveted steel; being lined above the fire lines with genuine fire clay tiling it is the most durable made.

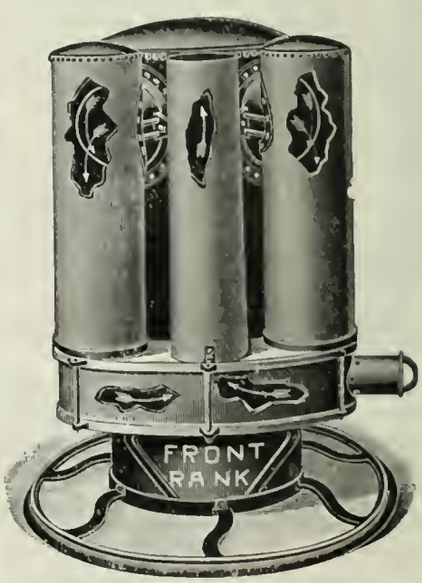
The radiators are very large and have an unusual area of heating surface in comparison with the size of fire pot.

These furnaces burn hard or soft coal or coke. We also make wood burning furnaces.

Send for our catalogue, it will give you a better idea of what we make.

FRONT RANK STEEL FURNACE CO.,

2301 to 2309 Lucas Ave., St. Louis, Mo.



GILT EDGE FURNACES AND COMBINATION HEATERS.

Registers, and Tin and Galvanized Iron Furnace Fittings.

MANUFACTURED BY

R. J. SCHWAB & SONS CO., = Milwaukee, Wis.

They regulate heat in residences, offices, stores, mfg. plants. Guaranteed.

...Wanted...

Mechanics familiar with the installation of house heating furnaces or boilers to sell and put up

No electricity or compressed air. Simple as a heavy spring motor can be.

SPRAGUE *AUTOMATIC* *DAMPER and VALVE* REGULATORS

Must be of good address and have ability as salesmen. Salary $15 per week and expenses. References required.

WRITE THE MANUFRS.,

They Are "Coal Savers."

HOWARD THERMOSTAT CO., Oswego, N. Y.

WEST WATER STREET

Money Makers for Dealers.

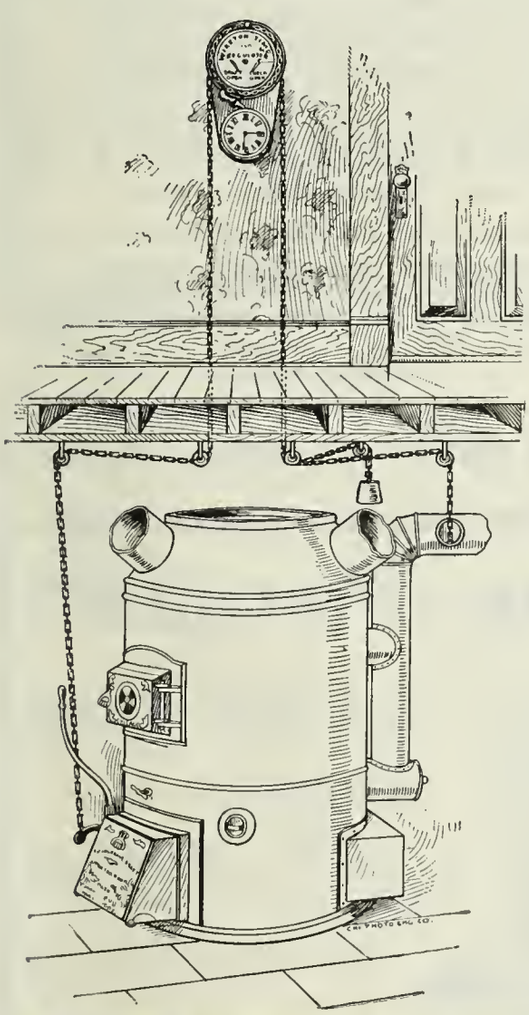
Gurney

HOT WATER GENERATORS
HOT AIR GENERATORS
STEAM GENERATORS
RANGES *and* STOVES
REFRIGERATORS
STEEL RANGES
GAS RANGES
FURNACES

GURNEY AND COMPANY

WASHINGTON, HANOVER AND ELM STREETS

BOSTON, - MASSACHUSETTS



The only thing like it ever on the market. Fully protected by patent. The Wireton Automatic Time Draft and Draft Regulator saves many times its cost in coal.

A Live Dealer Wanted in Every Town.

Prices, Terms and Catalogue furnished upon application to the

WIRETON HEATING CO.,

Manufacturers of

Quaker, Panama, Hoffman and Farquhar Furnaces, Pipe, Fittings and Furnace Supplies,

Blue Island, Illinois. Chicago Office, 40 Dearborn St.

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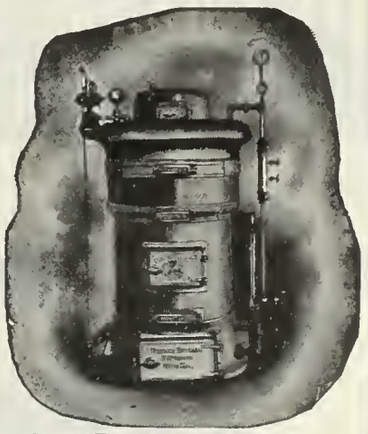
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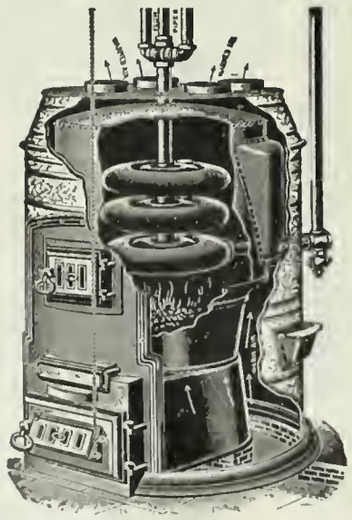
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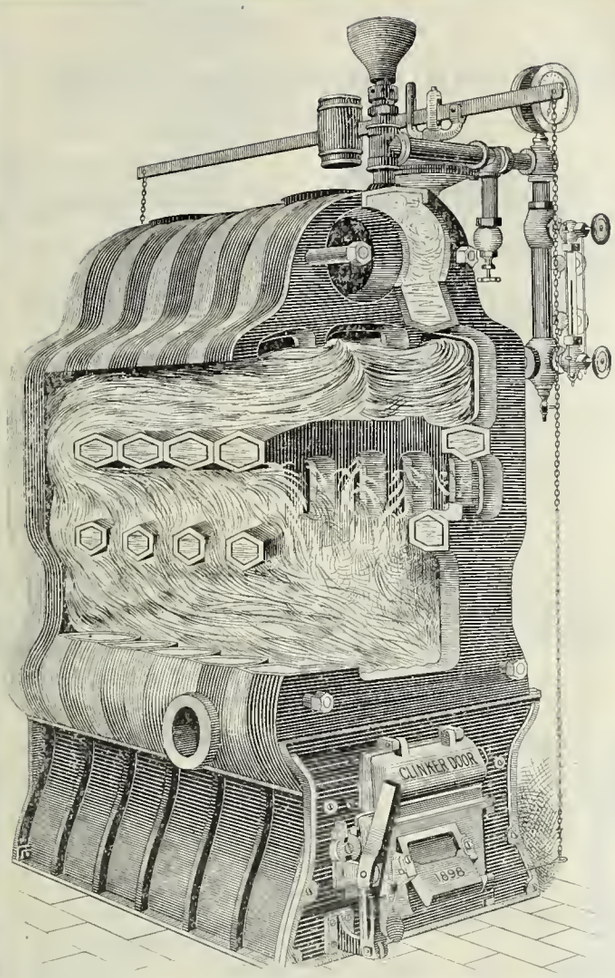
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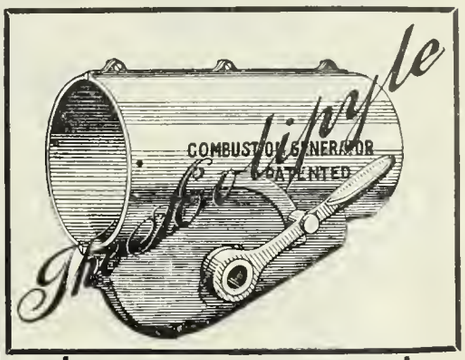
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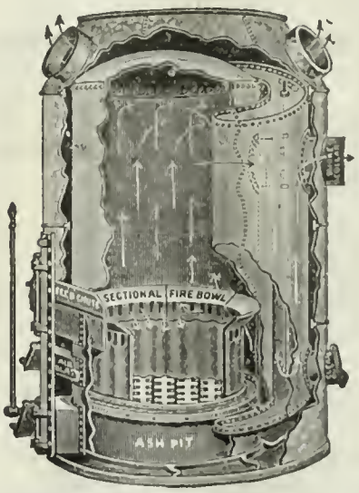
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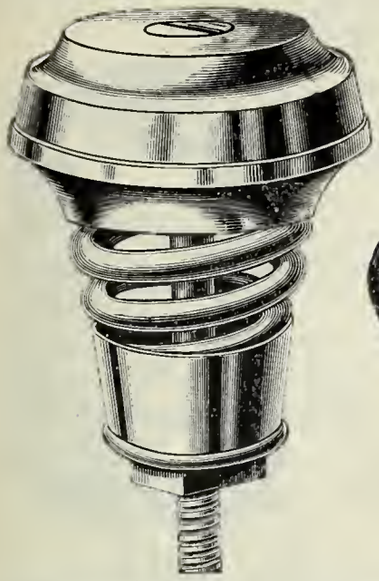
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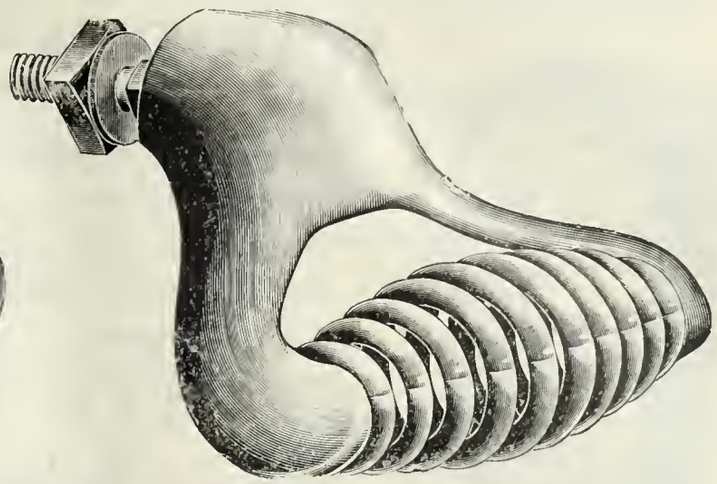
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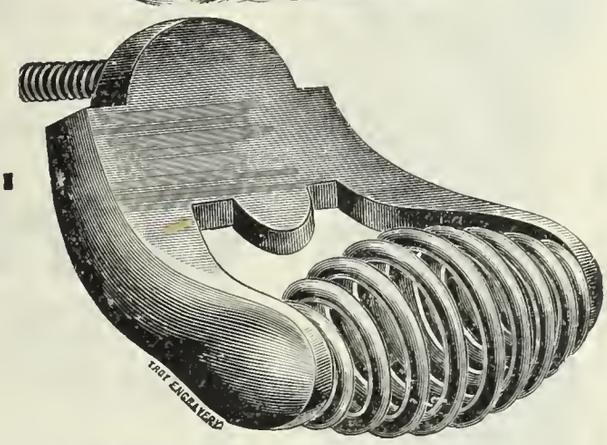
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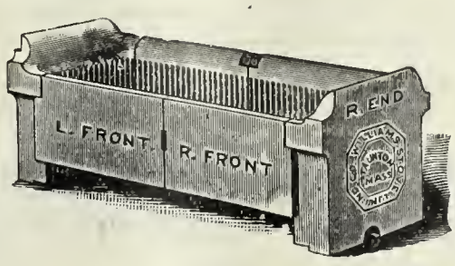
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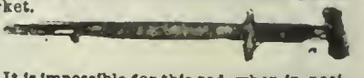


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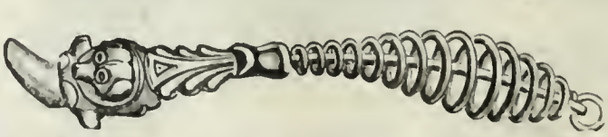
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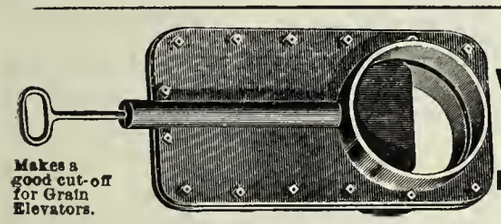
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Chapter II.—House Heating—Compares Furnaces and other apparatus, and describes Method of Setting Brick and Portable Furnaces—Location and Area of Cold Air Supply—Cold Air Rooms and Air Filters—Return Ducts and Air Circulation—Size of Hot Air Pipes—Location of Registers, etc.

Chapter III.—The Combination System—Discusses Heating Distant Rooms with Radiators—Balancing the System—Location of Water Heater in Furnace—Capacity of Water Heaters—Size of Radiators, etc.

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Chapter IX.—Estimate and Contract Blanks.

Chapter X.—Value of Fuels. The Proper Size for Furnace Chimneys—with tables.

APPENDIX.

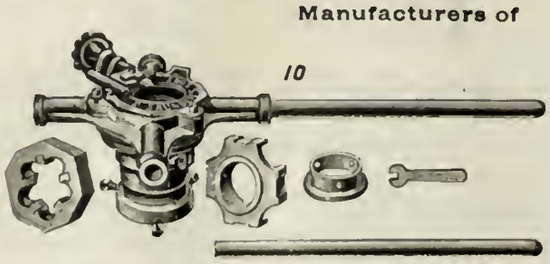
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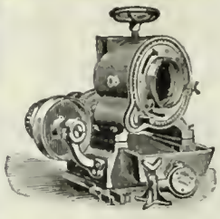
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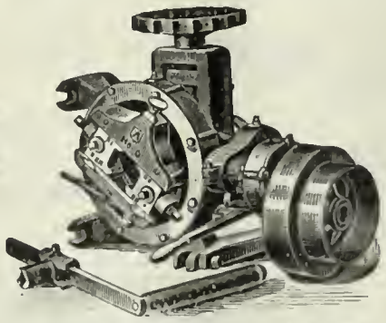
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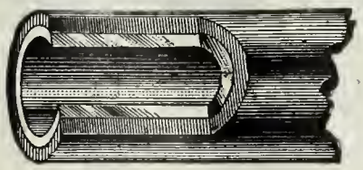
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Avoiding without extra expense all danger of lead or brass poisoning.

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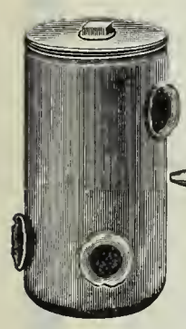


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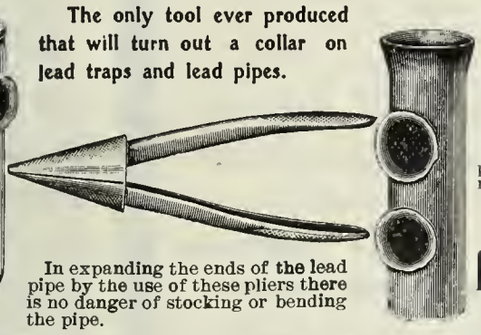
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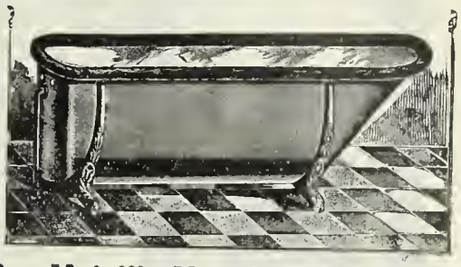


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Sample pair sent by mail to any point in the U. S., postage paid, on receipt of price.
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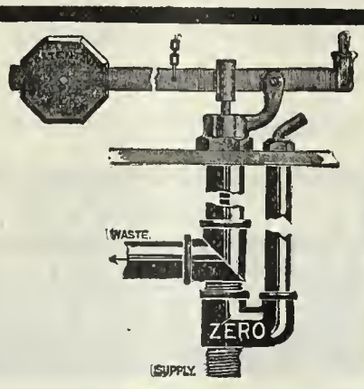
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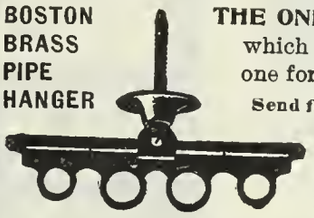
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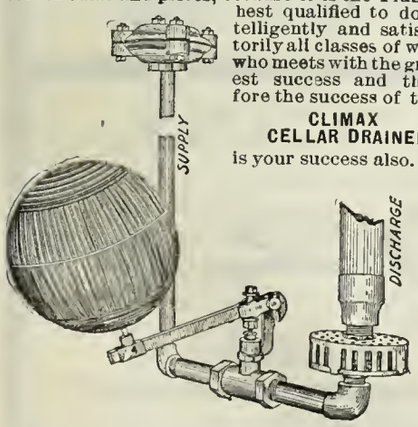
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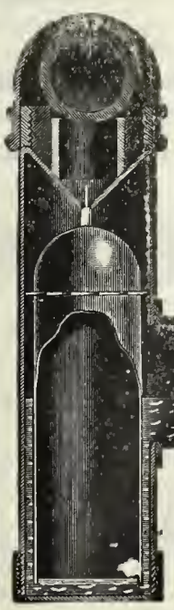


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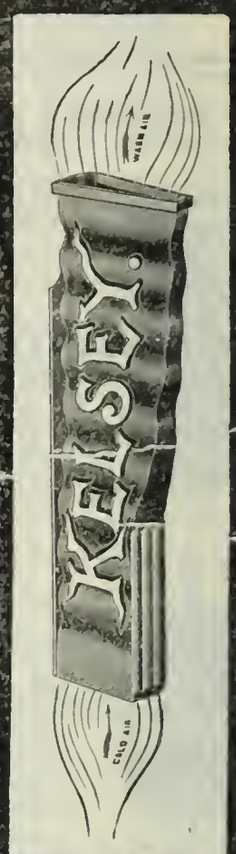
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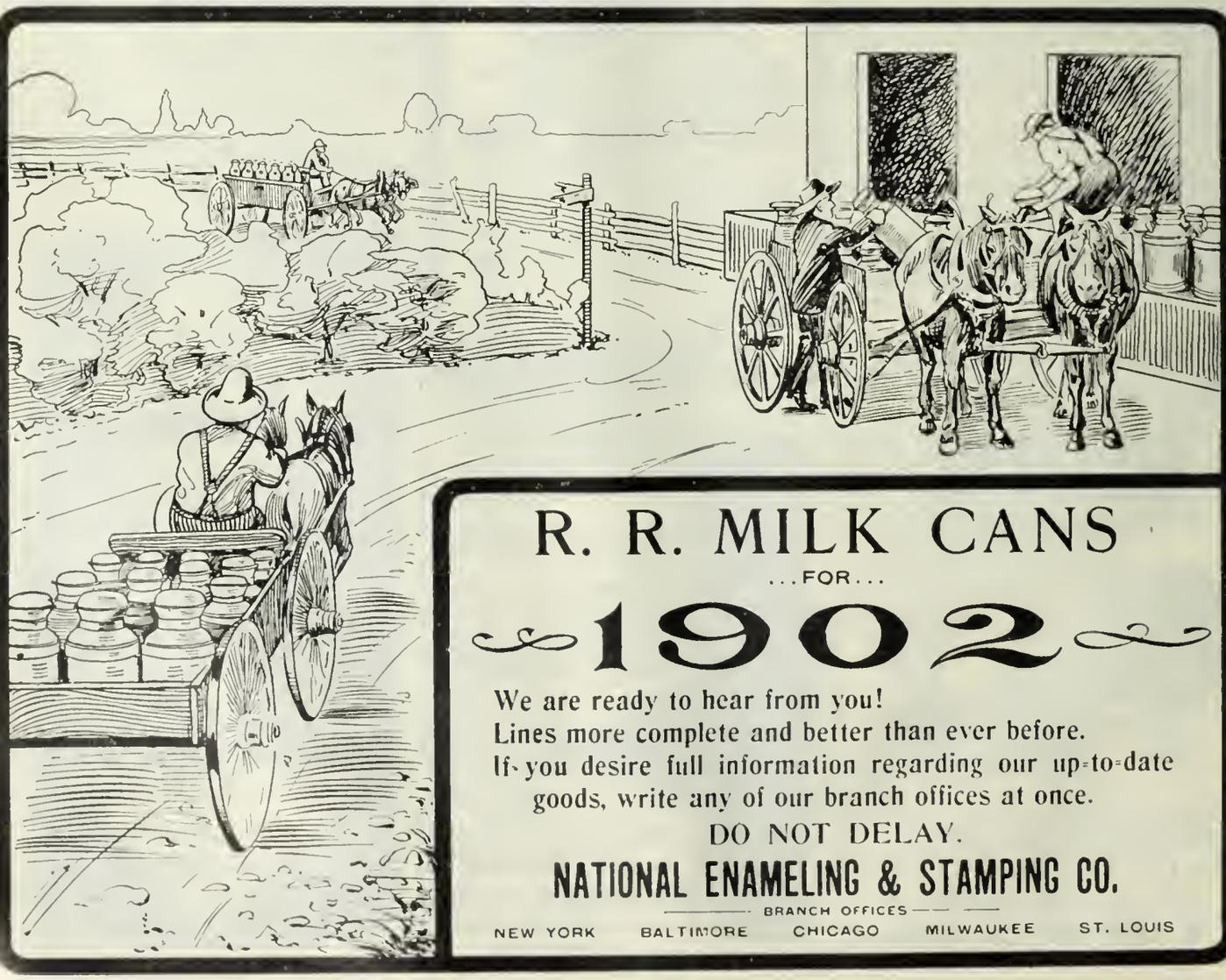
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NEW YORK AND CHICAGO.

New York, January 4, 1902.

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The Outlook for 1902.

The year 1901 will be remembered as a period of extraordinary prosperity in almost every branch of industrial activity in the United States. It is probable that never in the history of the country have conditions conspired so felicitously to stimulate business and provide satisfactory profits to American manufacturers and merchants. While the year just passed more than fulfilled the expectations formed at its opening, there are not wanting those who confidently predict that 1902 will even surpass the record of its predecessor. Indications all seem to point to a continuance of marked business activity during the present year. In the iron and steel trades, in particular, the situation is of the brightest. The demand for all classes of manufactures in this branch has been enormous, and most of the manufacturers of iron and steel products are filled up with orders which will keep their mills busy through the winter months. This is especially true in regard to the heavier finished products, such as steel rails and structural iron, plates, &c., in which the only difficulty is the ability of the manufacturers to meet the heavy consumptive demand. The requirements of the railroads for equipment, in the shape of cars and rolling stock, promises to be by far heavier than in any previous year. With an annual production of pig iron verging upon 16,000,000 tons—by far the largest capacity ever in operation in this country—the available stocks of iron are of the lightest. At the same time the consumptive demand is constantly growing. The only cloud in the sky is the interruption of manufacturing usually now existing by reason of the shortage of fuel, due to the car famine, which is causing serious inconvenience to both consumers and producers of iron, the latter being unable, in many cases, to ship their products in response to orders. It is likely, under these conditions, that the usual winter slacking up in the iron trade will be indefinitely postponed. The demand for the lighter kinds of manufactured iron and steel also continues in large volume. Manufacturers of sheets, for example, are carrying on their books a large bulk of orders which will serve to keep their mills busy and active for some months to come, notwithstanding the fact of considerable additions to the sheet producing capacity having been introduced in the past few months. The same is true of tin plates and of other of the lighter forms of manufactured iron. To sum up, 1901 was a banner year in the iron and steel trade, and its prosperity was reflected to a greater or lesser degree in most of the other trades in which our readers are interested. The outlook for the building industry in 1902 is regarded as of the brightest. A considerable volume of building of all classes is in contemplation, and a great deal of work in this line is already in hand. The activity in this branch of business is not confined to any one section of the country, but, according to reports from numerous quarters, seems to be practically general. The bearing of the activity of the building business upon the trades represented by this paper is important, and holds out the promise of a large degree of prosperity for our readers in the year which has just opened. Reports with which we have been favored, coming from all parts of the country and bearing upon various lines of business, are of a uniformly favorable tone, indicating that business men are looking out with confidence and a large degree of hopefulness for another year of prosperity and satisfaction. In greeting our readers with wishes for a Happy New Year, we feel that we have greater grounds for doing so with confidence than on many previous occasions in which we have been privileged to extend our good wishes at the opening of a new year.

Furnace Heating.

The new interest awakened in the furnace system of heating buildings with warm air gives promise of adding substantially to the already large demand for this staple heating apparatus. It is notable that the furnace system of heating has been selected by architects and their clients for a larger proportion of the fine residence buildings that were erected throughout the country last year than has been the case in former years. This is largely due to enterprise on the part both of the furnace contractor and the manufacturer. Many of the old complaints against the hot air furnace system of heating are no longer tenable in connection with modern furnaces when set up by men who have made a specialty of high-class work in this branch of heating. The modern furnaces are tight and better fitted throughout, while their construction provides for simplicity in operation and management and better control of the combustion than heretofore. Ash pits are ample; grates operate freely, and fire pots present greater heating surfaces, as well as more lasting qualities. The upper structure of the furnace, known as the "radiator," also exposes a large expanse of surface, and promotes efficiency and economy through a long fire travel, so that the available heat is utilized as far as practicable. Those who are devoting their attention to furnace heating are studying the results obtained, and are giving more time to the consideration of the requirements of the buildings to be heated and to calculating the proportions of the apparatus required, thus improving the general character of furnace work.

Architects, owners and furnace contractors, too, have given more study to the subject of ventilation in connection with furnace work. They realize that while the furnace system brings in continually a large volume of fresh and warm air to maintain the temperature in the building, it is also necessary to provide some means for the escape of the air already in the building in order to facilitate the inflow. Various systems of ventilation in connection with furnace work have been presented, and the interest in this feature increases, as it is more fully understood. Those furnacemen who make a study of this branch of work, with a view to stimulating the introduc-

tion of ventilating systems will find an increase of work for themselves, and stimulate the use of this popular method of heating. In modern high-class furnace work larger upright flues and stacks are provided, which is a distinct benefit to the furnace trade.

The work of the furnaceman to-day is greatly facilitated by the practically complete variety of fittings which are produced by manufacturers who have given special attention to producing such goods as will enable the furnaceman to meet the requirements of any kind of building. There is evidence of the furnace taking a more prominent place in the heating of school buildings through the use of fans. From various sections of the country come reports of such systems in use for this purpose and of contracts being awarded for blower systems of furnace heating. All plants of this kind that have been installed tend to demonstrate the fact that the furnace is admirably adapted for the purpose, and that it has peculiar advantages in buildings in which the fire is occasionally allowed to go out in the middle of winter, as it has nothing to freeze or suffer from intense cold. Where the blower system is used the heating is of a positive character, and the slight air pressure resulting aids in the work of ventilation. The furnace system was one of the first central heating systems to become popular for domestic use; and, apparently, after a test of about half a century, it enters upon a new century not only with its prestige unimpaired, but with increasing popularity and improved prospects.

Gasoline and Oil Stove Trade

The season for the sale of coal stoves is hardly over, and they have not yet been removed from their conspicuous place on the sample floor, yet already, throughout the country, the salesman with a line of gasoline and oil cooking stoves is seen. He is prepared, too, in many instances, to supplement an order previously given for oil heating stoves. Information received from the manufacturers of these goods shows that a number of new gasoline and oil cooking stoves are to make their appearance this year, while substantial improvements have been made on lines already popular in the trade. The experience with this line in the past, taken in connection with the new goods for which a canvass is now being made, affords a strong indication that a large sale may be expected for them this year. The popularity of this type of cooking apparatus has become so thoroughly established that neither the hindrances to their use that have been interposed in the past by the insurance companies, nor the annoyance that has been felt by reason of the vagaries in the prices of both oil and gasoline is likely to interfere materially with the demand. Even those coal stove dealers who reluctantly added this style of cooking and heating apparatus to their stock have found it profitable to familiarize themselves with all the details of their construction, and the methods of overcoming the little troubles met with by their customers in their use, and to use some energy in pushing the sale of these goods. While it seems to be yet early for merchants to give any considerable thought to summer goods, the time that is devoted to the salesmen when they appear with their samples and literature of these staple summer goods will be well spent.

Heating Boilers and Supplies.

An effort has been made by the manufacturers of boilers for steam and hot water heating to agree upon a price for their product which shall hold well into the year. At this time there is indication that the prices that may be agreed upon will show an advance over those now ruling, as the manufacturers feel that an advance is warranted by the prevailing conditions. The influence of the boiler manufacturers has also been used to secure a similar action on the part of the manufacturers of radiation, although no evidence of a contemplated advance is manifest in that line. During the past year the manufacturers of boilers have succeeded in maintaining a remarkably steady market. Steam fitters who placed bids early last year were enabled to purchase the boilers when needed at the prices on which they were estimated. This has resulted in a better relation between the different interests in this branch of trade. It seems at the present time that considerable influence will be exerted in the endeavor to establish this relation upon a more lasting basis, so that the steam fitter may place his orders early. This would enable the manufacturers to derive the benefits attending an advance knowledge of the demands that are likely to be made upon them during the year. Having this knowledge they would be able to run their plants on an economical basis and produce stock in such volume as to avoid disappointments and delays in the rush season. The success that has attended the efforts of this branch of manufacturing during the past year lends strength to the influence that is being brought to bear upon manufacturers of valves and brass goods to pursue a similar course.

Reports from all sources indicate that the total number of boilers sold in 1901 was considerably in excess of the highest number sold in any previous year. Those who have watched the outgoing steamers state that hardly a freight steamer left the port of New York during the year that did not have in its cargo a consignment of heating goods, including boilers, radiators, valves, pipe and fittings. Evidently the sales of American heating goods abroad are growing. While less complaint was heard last year than in some other years of inability to get goods when needed, it is claimed that a shortage of stock materially reduced the number of boilers shipped abroad, the foreign orders having been considerably in excess of the available supply. The production of boilers and radiators is likely to be considerably increased during the coming year, through the consolidation of several well-known concerns into one large company, who contemplate the extension of some of their plants and the better utilization of the existing facilities. In another instance the management of a successful boiler house have embarked in the manufacture of radiation and contemplate a large output for the first year.

The enterprise of the heating contractors was reflected in the successful convention of the National Association of Master Steam and Hot Water Fitters, held in June at Niagara Falls. The usefulness of the work taken up by the American Society of Heating and Ventilating Engineers was also demonstrated in the interest taken in the summer meeting of that body, held in Chicago. It is worthy of note that prominent European engineers have been enrolled in the society in sufficient numbers to make a considerable proportion of its membership. The proceedings of the annual meeting of the society, to be held January 21 to 23, will be attended with interest.

The Plumbing Trade.

At the opening of the new year interest in the plumbing trade is found to be active. On the one hand the promise of an excellent year seems already assured, while on the other there are differences to be adjusted between the association plumbers and the makers and dealers in plumbing goods. The travelers who have come in for the holiday season bring reports of enterprise in every section in the planning and erection of new build-

ings, for which the demaud for plumbing supplies, if realized, will keep the producing capacity now available well occupied during what is ordinarily the dull season. It was ouly in the last part of 1901 that shipments in many lines of staple goods become at all prompt, while the demand for some staples is still in excess of the supply, and can only be supplled as goods are produced from day to day. The latter half of the past year was notable for a marked stiffening in prices all along the line of plumbers' supplies. This should be productive of better profits to the manufaceurer. Stiffness coming at this season enables the contractor to make his estimates so as to insure profit on work which he may secure. The only exception to the genceral rule of firm prices that seems in view at this time is on brass goods, which are not unlikely to be affected by the recent slump in copper. It has been asserted, however, that manufacturers of brass goods made little money during the past year, and they claim that maintenance of the present prices would only give them a fair return for their enterprise.

The bulk of the business of the year in plumbing goods was done under a more satisfactory understanding between the manufacturers and the plumbers than has marked some previous years. An Interesting condition was developed in the latter part of the year, however, which has not yet been disposed of. This came from the abrogation of some of the important provisions of the New York Conference Resolutions, which, though ratified with some reluctance by both parties, have been the means of avoiding the unprofitable dissensions which have heretofore marked the trade. At the present time both the manufacturers and the plumbers have adopted a set of resolutions, but as neither has been accepted by both parties, the relations existing in this important branch of trade are not clearly defined. It is believed that an effort will be made to secure an agreement between the dissenting interests which will be mutnally satisfactory. Several meetings of the various manufacturers' associations have been held recently and the mid-year meeting of the Executive Committee of the National Association of Master Plumbers is near at hand. Every influence is being brought to bear by the conservatives in both of the interested bodies to secure an adjustment of the differences and a restoration of the business relations which were satisfactory to a large majority.

The extended use of the most handsome and highly finished plumbing goods has been a feature of the past year which has been beneficial alike to the plumber and the manufacturer, and which is especially gratifying as the indications are favorable for a still larger use of the same character of fittings in the year just opening. Exports of plumbing material have also assumed important proportions. The shipments have been made not only to nearby countries and to the new possessions of the United States, but European houses which were formerly shippers of great quantities of plumbing materials to the United States are now equally good buyers from the United States. The attention which these shipments has attracted abroad, and the fact that displays of American plumbing materials are being made in numerous important foreign centers, bear promise of larger shipments to the same fields. Only a few years ago all of the enameled iron bathtubs and the solid porcelain bathtubs, lavatories and other sanitary fixtures were imported. Now not only have the manufacturers of the United States solved the problem of producing these goods, but through their excellence in finish and greater beauty of form, as well as by reason of their lower cost, these goods are not only being used in greater quantity at home, but are also in demand by foreign buyers.

Roofing and Cornice Work.

Sheet metal has taken a prominent part in the construction of buildings in the last quarter of a century, and the indications all point to its still greater use in the future, owing to its adaptability to the requirements of modern construction work. Advices from many quarters demonstrate a revival of the popularity of tin plates for roofing, due to the improved quality of plates that have been produced by the American manufacturers. It is notable that black and galvanized sheet iron in various forms has proved popular for covering many classes of business buildings and some residences. In the better class of buildings erected by the Government and by private enterprise copper is still held in high esteem for roofing purposes. Now that the price of sheet copper seems likely to reach a figure that will bring it within the reach of a greater number of consumers a revival in the use of this metal for construction work may be expected. Sheet metal lends itself admirably to the production of imitation tiles, and owing to the pleasing architectural effect of these metal tiles those who manufacture them have found a rapidly increasing demand for their product.

For wharf sheds, factory buildings and warehouses sheet metal siding has come into extensive use, and there is no indication of a reduction in the tonnage that will be required for these purposes. The facility with which imitations of stone and brick can be reproduced in sheet metal has led to an increasing demand for this style of siding. The weight of foundations of massive buildings has been very materially reduced through the use of sheet metal for window heads and ornamental cornices and for general ornamental purposes. Whereas in the past the tinsmith was also the roofer and constructed such sheet metal finish to buildings as were needed, the popularity of sheet metal for the purposes above referred to is now sufficient to support large separate shops employing respectively tinsmiths, roofers and cornice makers. It has also brought about the establishment of numerous large works for the construction of special machinery for preparing the materials for use. As a further indication of the trend in this field some of the finest buildings that are to be erected during the coming year will be provided with sheet metal roofs, gutters and conductors, and be embellished by sheet metal cornices and other architectural ornamentations. Sheet metal skylights have also almost entirely displaced all other kinds and their use is extending to new fields, which gives promise that the skylight maker is to share in the work that the new year is bringing to all lines of trade. The use of sheet metal, moreover, has not been confined to the exterior of buildings, but the handsome panel work that has been produced in sheet metal adapts it for ceilings and side walls of buildings of all classes. Not only is a fine artistic effect secured by the original design, but through the assistance of the painter a color effect is also obtained that adds greatly to the demand for this kind of finish for rooms, corridors and halls. Another important quality is that this finish is both fire and water proof, a feature that is not lost sight of in the present effort to erect safe buildings. Its safety and beauty combine to promise a large increase in the use of interior sheet metal work. The workmen will continue to profit by the activity in this branch, where already the demand for those who have a thorough knowledge of every detail in the production of their work is unsatisfied. This should prove an incentive for further effort to master every branch of the trade from the blue print to the finished work in place on the building.

Tinsmithing.

The tinsmith continues to be in active demand in these progressive times, notwithstanding the fact that the drop press and machinery now turn out practically all of the ware and much of the work that formerly occupied his hands, particularly during the winter months. He is now occupied in many lines of work which were practically unknown at the time he was so busy showing his skill and taking such great pride in the finish given to the extensive line of household articles that come under the head of tinware. Those men who have devoted time to the study of geometry and the practice of drawing, so as to enable themselves to cut patterns for any articles that they may be called upon to make, have had no difficulty in keeping constantly occupied and at top wages. Such men are qualified to do any of the work that may be brought to a shop where they are employed, whether in the line of general jobbing work, making dust or other conveyors, blower piping, heating work or the infinite variety of commercial and special work developed by modern demands and for which the tinsmith who can make his work from scale drawings is indispensable. None of the vagaries in decreasing sizes of pipes and elbows with reducing branches at various angles, or the original shapes of commercial constructions, present problems or obstacles that the knowledge and skill of the first-class tinsmith cannot dispose of in a manner that reflects credit upon the craft.

His thorough training as a tinsmith has also qualified him to make a success of any branch of sheet metal work, whether in copper, brass, galvanized iron or heavy sheet iron work for smoke stacks and steel ranges. The indications at the close of the first year of the century are that the new century in its progress will find the tinsmith an indispensable factor, and it is probable that the demands on his skill and knowledge will be greater than in the past. Those who still desire to honor this ancient craft will find it necessary to work with their heads as well as with their hands. It will be necessary to take advantage of the evenings for acquiring a knowledge of geometry and drawing, either from books or in such schools as may be convenient, or by means of the correspondence schools that are available to the craftsman of today. Young men who are ambitious to succeed must adopt some such course, but they should also give close attention to the way more advanced workmen do their work and inquire into it in detail. Tinsmiths who are properly qualified will not become obsolete in the world's workshop, but will continue in active demand at good wages.

The Sheet Metal Field.

Among the interests that secured a full share of the prosperity that marked the year just closed the sheet metal manufacturing industries, especially in the line of tin plates and sheet steel—took a place well at the front. The growth of the use of sheet metals for purposes in which other materials were formerly employed has been very pronounced of late years, and, from all accounts, there was a marked development along this line last year. Numerous articles that formerly were made of wood are now being manufactured largely of sheet metal, owing to the superior lasting and fire proof qualities of the latter, as well as its greater lightness and comparative absence of bulk. The ease with which sheet metal can be stamped and formed up into any required shape by the aid of the improved modern machine tools has materially aided this development. In this connection the prediction is confidently made by one manufacturer that as wood increases in value sheet metal will be substituted, and that in a few years a large proportion of household furniture will be made of it. There is a constant tendency, too, to make from sheet steel a number of goods that were formerly cast or forged. In the line of hardware, such articles as knobs, locks, wrenches, sprockets, wheels, brackets, &c., are now turned out complete in very few operations by presses and dies, thus greatly cheapening, as well as expediting, their production. The rapidly expanding use of sheet metal for architectural purposes, referred to elsewhere, is another marked development of the trade which provides a large outlet for the product of the rolling mills. This entrance of sheet metal into new fields of usefulness is adding materially to the demand not only for sheet steel, but also for sheet copper and brass, and in some instances for sheet aluminum, although the increase in the use of the last named metal has not been as marked as was expected. The high price of copper and brass prevailing during nearly the whole of 1901 tended to restrict the use of those materials to some extent. Nevertheless, the demand for them was of generous proportions.

In spite of the strike that tied up practically the entire tin plate industry for over three months during the summer and closed many of the sheet mills for a lesser period, the manufacturers in these lines have little or nothing to complain of. The demand for both tin plates and sheets was unusually large and steady throughout the past year, and the mills enter upon the new year with well filled order books and bright prospects for a continuance of good business at remunerative prices. The virtual monopoly of the tin plate trade possessed by one great corporation removes that industry to a large extent from the area of competitive business, but it is unlikely that the complete control of the market will remain indefinitely in one hand, however powerful. The movement toward the erection of independent tin mills has already begun, and development along this line may be looked for in the future. The enormous demand for sheets, which was sufficient to keep all the mills busy at their full capacity through 1901, shows no sign of abatement. The sheet mills, both independent and of the combination, enter the new year with all the work they can take care of for the next two or three months, and many with orders for delivery through the first half of the year. These orders are booked largely at present prices, which insures a very handsome profit to the manufacturers. It is estimated that the earnings of the leading interest approximated $1,000,000 a month all through last year. This prosperity was also reflected upon the independent mills. However, there is a large tonnage of new capacity rapidly coming into the sheet market, and these new mills are soliciting orders very aggressively. By July 1, when most of the new mills are likely to be in operation, the productive capacity of the sheet industry will have been enormously increased, and unless the present tremendous volume of consumption keeps up in proportion the supply is likely to exceed the demand, with the usual result attending brisk competition. This is a feature of the outlook in regard to which much uncertainty exists.

Tin plates for all the usual purposes have secured a large sale and the output of 1901 is said, on the authority of an official of the American Tin Plate Company, to have been fully up to that of the preceding year, in spite of the prolonged suspension of operations by the mills. It is likely that the present year will show a large expansion of tin plate production, with a reduction of the cost of manufacture by the introduction of the new and revolutionary process of rolling black sheets that has been adopted by the tin plate corporation. This should

lead to lower prices on tin plates and may possibly be the means of enabling the American manufacturers to open up a foreign market for their surplus product in this line. There is every indication of continued activity in the demand for tin plates through the year, which should be sufficient to absorb the existing productive capacity. Terne plates for roofing seem to have entered upon an era of revived popularity. The demand in this line runs largely to the higher grades of old style heavily coated plates, the merits of which are fully recognized by the roofing trade. The growing consumption of sheet metal for old and new purposes has stimulated the buying of special machinery for working it. Manufacturers in this field have an unusually prosperous year to their credit, and they regard the future with satisfaction. The introduction of new and improved designs in sheet metal machinery has gone along rapidly of late and the makers are keeping well abreast of modern requirements. They are also developing a considerable export trade in their specialties which promises to assume important proportions. To sum up, there is nothing in sight at the present time to hinder an excellent year of trade in sheet metals and the machinery and tools necessary to their manufacture into the many forms called for by modern requirements.

Industrial Consolidations in 1901.

The general prosperity of the year 1900 brought with it a marked increase in the movement toward industrial consolidation, the aggregate capitalization of large industrial corporations in the year just closed amounting, according to a calculation made by the New York *Journal of Commerce*, to the enormous sum of $2,805,475,000. This amount, of course, was materially swelled by the formation of the United States Steel Corporation, with a total capitalization in stocks and bonds of $1,400,000,000. But even allowing for that large sum, the increase over the aggregate capitalization of industrial corporations in 1900 was very marked, being nearly $2,000,000,000. As compared with 1899, it was $140,000,000 over the total for that year. A pronounced feature of the industrial consolidation movement in the past year was a series of heavy increases in the capitalization of consolidations already existing. These increases amounted in all to over $230,000,000. Among the consolidations completed in 1901 were the American Can Company, with $88,000,000 capital; the American Locomotive Company, with $50,000,000; the Allis-Chalmers Company, with $50,000,000; the Federal Boiler & Supply Company, with $3,500,000; the H. W. Johns-Manville Company, with $3,000,000; the United Engineering & Foundry Company, with $5,500,000; the Union Lead & Oil Company, with $15,000,000; the United States Reduction & Refining Company, with $10,000,000, and the great United States Steel Corporation, already referred to. Among the concerns who extended their capitalization during the year were the Amalgamated Copper Company, with an increase of $80,000,000; the American Smelting & Refining Company, with $35,000,000, and the National Enameling & Stamping Company, with $2,500,000 increase.

In connection with the figures for 1901 it should be noted that the aggregate capitalization last year was swollen by a considerable amount of duplication, owing to the fact that consolidations formed during former periods have been merged into still larger corporations. This is particularly true in the case of the United States Steel Corporation, most of the constituent companies of which had already been incorporated in 1899 and 1900. Allowing for such duplication, however, the total capitalization of industrial consolidations in the past three years would still be in excess of $5,000,000,000. The aggregate capitalization of purely industrial consolidations operating in the United States at the present time, after making all allowance for duplication, is placed approximately at $6,500,000,000. As in the previous two years, a number of consolidation projects were started during the past year and carried along to more or less advanced stages and then abandoned. The panic in the stock market in the early summer, and the conditions in the money market which followed, were inimical to the completion of many large financial schemes, and caused the postponement of several large consolidations, having among them an aggregate proposed capitalization of over $1,000,000,000, that were projected. It is likely that some at least of these schemes will be revived during the coming year.

The Board of Directors of the Louisiana Purchase Exposition, to be held in St. Louis in 1903, announce a prize competition, open to the world, for a symbol or emblem for the exposition. The emblem is to be used for the seal, the stationery and advertising matter of every description. An appropriation of $5000 has been made for the same, $2500 of which will be awarded to the successful competitor who submits the prize design, the rest of the money being divided up into honorariums of $250 to each of eight selected artists, and the balance for the expenses of the jury of award. Eight sculptors or artists will be selected to submit designs for the emblem, but in addition to these chosen eight the entire art world, from the newspaper artist to the National or Royal Academician, is invited to participate in the competition. No rules are laid down as to lettering, sentiment, size or style of the design. The only stipulation is that it shall be symbolical of the great historical event which the Louisiana Purchase Exposition is to commemorate, the acquisition by the United States of 1,042,000 square miles of territory from France in 1803, an event which is one of the most important in the history of the United States. A period of six months will be allowed for the competition.

Anthracite Coal Trade of 1901.

The Philadelphia *Ledger* of December 30 sums up a review of the anthracite coal trade of 1901 as follows: The anthracite coal year of 1901 is practically completed, and the estimated tonnage mined and sent to market makes it the banner year for this great industry. The estimate is that about 53,500,000 tons have been produced for 1901, which is an increase of about 8,400,000 tons over 1900 and by far the largest annual product of the trade. Could there have been ample facilities for coal shipment and no car shortage at the mines the market would have taken a much larger output, as the demand for anthracite has exceeded the supply during the latter part of the year. Prices are unchanged, the full circular rates being obtained, and there is no indication of any advance in contemplation by the producing companies.

A London paper reviews the century in a nutshell, as follows: "We received the goose quill and bequeath the typewriter; we received the scythe and bequeath the mowing machine and the self binder; we received the hand printing press, we bequeath the cylinder press; we received the tallow dip, we bequeath the electric lamp; we received the galvanic battery, we bequeath the dynamo; we received the beacon signal fire, we bequeath the telephone and wireless telegraphy; we received ordinary light, we bequeath Roentgen rays."

The manufacturing establishments of Tennessee, according to a bulletin issued by the Census Bureau, increased 75 per cent. in number between 1890 and 1900, the number in the latter year being 8009. Their capital was $71,222,680, an increase of 38 per cent.

The Stove Trade in 1901.

BY GEORGE W COPE.

The stove trade of the past year was of somewhat larger volume than that of the preceding year. Competent authorities are of the opinion that it was at least 10 per cent. larger, taking the country as a whole. Viewed from this standpoint, the year may be regarded as fairly satisfactory. The improvement in trade was not evenly distributed throughout the country, as some sections enjoyed a very much larger business than others. This, however, is frequently the case. It would be remarkable if the conditions prevailing throughout such a large country as the United States would be equally operative in all districts. The West was undoubtedly the most favored in the matter of increased business. It has happened in times of great depression that Eastern trade has shown a degree of steadiness and regularity to which the West has presented a comparison unfavorable to the manufacturers of that section.

The West is peculiarly susceptible to changing conditions, owing to the preponderance of agricultural interests, as Western trade depends so largely on the consumption of stoves by farmers and by residents in towns located in purely agricultural districts. The East, being more thickly populated and depending to a less extent on agricultural pursuits, shows less diminution of trade when farm products are low in prices and agriculturists are discouraged. For the past four or five years the Western farmers have enjoyed abundant crops and have been able to market them at good prices. This has placed the inhabitants of the West in a position of financial ease, enabling them to be heavy consumers of all classes of manufactured goods. The prosperity of the West has caused great growth in its towns and cities, as well as heavy additions to be made to the number of persons engaged in agriculture. Thus a growth in the volume of business has practically been assured, even though peculiar conditions may occasionally have caused some apprehension relative to the maintenance of the demand for manufactured goods.

SCARCITY OF MATERIAL.

The Western stove manufacturers have not found their business entirely free from adverse influences. They have, in fact, had much to contend with, so that their experience during the year has not been one of total freedom from anxiety, and of the steady booking of large orders. They were confronted early in the year by a heavy advance in the price of sheet steel, due to the shortage in stocks caused by the long idleness of the sheet mills in 1900. As so much sheet steel is now used in the construction of stoves and ranges this injected into the trade a disturbing influence. It is always a difficult matter to advance prices immediately to a point sufficient to cover the increased cost of an essential material. Manufacturers are not in every case immediately affected by an increase in the cost of materials, as, for various reasons, some of them are invariably found fairly well stocked The latter are then in a position to take advantage of their less fortunate competitors, being able to supply the trade at old prices and thus secure an enlargement of their business. As the year advanced the scarcity of sheets became more pronounced, and in July a strike was precipitated in most of the sheet mills of the country, which continued for nearly three months and brought about a condition of practical famine in this material. This would have created great trouble in the trade if the largest stove manufacturers had not received ample warning of the possibility of such an occurrence and accumulated a sufficient supply to carry them through this period. Nevertheless, quite a considerable proportion of the manufacturers suffered from the shortage in the supply of sheets and found themselves unable in the fall months to satisfy the requirements of their customers.

DROUGHT IN THE WEST.

Another influence of an adverse character was the great drought which prevailed throughout the West and Southwest during June, July and August and which heavily reduced the crop of corn. The area covered by this drought extended from Ohio on the east to Northern Texas in the southwest and as far north as South Dakota. Thus it completely covered the great corn belt of the country. This drought came at a time when the Western stove manufacturers were securing orders for fall delivery. They naturally feared that their orders would be heavily reduced on this account. Fortunately, however, the sections most affected by the drought had garnered a very heavy winter wheat crop, which was out of the way by the time that the drought began to be serious. This fact, coupled with the excellent financial condition of the Western farmers as the result of several successive years of abundant crops, enabled the people of the afflicted region to continue to purchase such manufactured goods as were needed without regard to the diminution of their year's earnings by the reduction in their corn crop. Thus it happened that what in some years would have been considered a great calamity passed off without serious results and now appears to have cut but a slight figure in the business transactions of the year.

GROWTH OF THE WEST.

Against these adverse influences may be placed the great growth of the West, caused by the abounding prosperity of previous years. Improvements of all kinds were undertaken, not only by railroad companies, but also by manufacturing establishments generally and by individuals. More immigrants settled in the West than had been the case for several years, taking up additional farming lands. Great additions were made to manufacturing towns, and unusual activity was apparent in building operations in all Western cities and towns, as well as in the strictly rural districts. These activities naturally brought with them increased business in the stove trade. Great growth was seen in all classes of heating apparatus, the furnace manufacturers never having had such a year, while the manufacturers of hot water and steam boilers also enjoyed a great growth over previous years. The stove trade was not injured by the growth in these lines, but received its share of the general impetus given to trade.

THE EASTERN TRADE.

The Eastern stove manufacturers enjoyed a fair business as a result of the generally prosperous conditions prevailing among the manufacturing interests. The year was one of activity in all manufacturing lines, and this naturally brought with it such full employment for workingmen that the consumption of stoves was well up to the average. In some sections in the East, particularly in and about New York City, considerable complaint was heard during the year relative to the cutting of prices. This could undoubtedly have been avoided if the manufacturers had arranged for better co-operation with one another and thus preserved more thorough control of trade relations. In other sections of the country no special difficulty of this character became manifest. The volume of business was such as to keep manufactur-

ers well employed. and it was not found necessary to make concessions in order to effect sales. In fact many Western manufacturers at times were unable to keep their customers supplied. The stove trade of the South was not only large, but showed an increase over previous years. The South is steadily improving in its financial condition, and as Southern industries expand and manufacturing towns grow larger the consumption of stoves correspondingly grows. The leading stove manufacturers invariably reported greater activity and larger business during the entire year.

DETAILS OF THE YEAR'S TRADE.

The year opened with only a moderate volume of business in progress. The trade had been well supplied with stoves during the fall of 1900, and the mild weather prevailing throughout the country in January gave no special reason for dealers to make additions to their stocks. The general prosperity of the people caused all manufacturers and dealers to take a hopeful view of the year's prospects and, generally speaking, all were prepared to take advantage of any favorable indication and held themselves in readiness to increase their lines wherever this might prove advantageous. Despite the hopeful feeling, however, the first quarter of the year was somewhat disappointing. Even Western business continued quiet until toward the end of March, when an improvement was noted.

April opened with a better condition of trade in the West, which was due largely to the strengthening of prices in iron and steel. Dealers anticipated advancing prices as a result of increased cost of materials and placed orders more freely, exhibiting a disposition to lay in stocks. The Western manufacturers this month notified their trade that no orders would be accepted for delivery later than July 31, because of the great advances which had been made in the price of sheets and the higher rates ruling for pig iron, which would increase the cost of manufacturing stoves. Before the month had ended the stove trade showed a great increase in volume and conditions began to indicate a banner year. The East felt the effect of these conditions to some degree, but not to as great an extent as the West. It appeared that considerable stock had been carried over from the previous year by Eastern dealers, which naturally prevented them from making further commitments even in placing orders for future delivery. June showed a still greater growth of business in the West, the leading manufacturers reporting that they were having a volume of business at least double that which they had experienced in the spring of the previous year. It should be remembered, however, that this comparison was made with the conditions ruling in 1900 after the great break in the price of wire products had unsettled all lines of trade.

July brought with it a continuance of large busines in the West, but uneasiness began to be experienced early in the month, because of very dry weather, which had continued for some weeks. As the month progressed the drought continued and its effects spread over a still greater area of the country. At the same time the Eastern section of the country suffered from an unusual precipitation of moisture, and caused an equally anxious feeling relative to the agricultural situation in that part of the country. August, however, brought relief from the drought in the West, and although the damage to the corn crop was known to be heavy, much reason for rejoicing was found in the fact that cancellations were few, even from the districts which were most afflicted. A peculiar condition of affairs was reported at this time. Stove foundries located nearest to the drought stricken localities were enjoying a heavier trade than usual, because the dealers who had been impelled by caution to place few or no orders were desirous of securing quick shipments and turned to their nearest sources of supply. The fact was then demonstrated that practically no overbuying had occurred in the West, notwithstanding the excellent condition of trade during the spring months. September brought with it a hardening of prices in oak stoves and sheet steel goods generally, on account of the shortage in sheets caused by the great steel strike. For a time it appeared that prices would be materially advanced on these lines, but instead of this the supply was simply cut down by the inability of some manufacturers to secure stock, and those who were able to supply the trade maintained their prices instead of advancing them.

The closing quarter of the year proved exceedingly satisfactory to Western manufacturers. The weather conditions enabled a continuance of the usual fall trade, not only during the ordinarily broken weather of October and November, but, in good volume, until late in December. Dealers generally were able to dispose of their entire stocks, and in very few cases were complaints heard that they had overbought. Eastern business proved to be fairly satisfactory also, and the year thus closed with manufacturers and dealers in good condition to enter upon the business of the coming year.

An important development in December was the general withdrawal of prices by the Western stove manufacturers, who were impelled to take this step because of the steadily increasing cost of manufacture. This action was decided upon at the meeting of the Western Association of Stove Manufacturers, held in Chicago on the 17th and 18th of the month. As the Western manufacturers have almost invariably taken the initiative in a movement to advance prices, it is to be expected that their action will have a strengthening effect on the prices made by manufacturers in other parts of the country.

PROSPECTS FOR THE COMING YEAR.

It is usual to take a hopeful view of the future. Although general conditions may sometimes make the outlook uncertain, yet, as "hope springs eternal in the human breast," it is natural to endeavor even under such circumstances to extract some degree of confidence. At this time, however, we find no element of a disturbing character either checking the volume of business or threatening to interfere with its healthful growth. The political situation is settled for some time to come, and therefore no danger presents itself of an early change in national policies, always a cause of shrinkage in trade and dampening of enterprise. Our national finances could hardly be in better shape. The currency question, which but a short time since caused so much trouble to the business world, appears to have been permanently settled. Workingmen were, perhaps, never more fully employed than at the present time. Agriculturists are in good financial condition, certainly in far better shape than the agriculturists in any other country in the world. The shortage in the corn crop of last year has been seen not to have caused any special trouble or disturbance, and even the people of the corn belt are apparently purchasing all classes of merchandise as freely as though the crop had been of the average size.

The general condition of the West is perhaps more accurately indicated by the hardware trade than in any other way. As the hardware business for the last half of 1901 was greater than ever before known, and all representatives of hardware houses are exceedingly sanguine of a very good year's business in 1902, it is believed that the stove trade will feel the effect of the benign influences thus demonstrated or indicated. Probably at no previous time have the dealers, particularly in the West, closed a year with such a small stock of stoves as the year just ended. Manufacturers, likewise, have pretty thoroughly cleaned up their stocks, and are in most satisfactory shape to take hold of the coming year's trade. The only thing to be feared is a repetition of last year's damage to any of our important crops; but, as preparations for trade must be made in the expectation that the season will be favorable, such a possibility will certainly have little or no influence on the business coming up during the first half of the year.

STEEL GOODS.

The tendency toward the use of steel construction in stoves and ranges, which has been so prominent a feature of the trade in recent years, made still further progress in 1901. Nearly every stove company are now manufacturing steel ranges, even though the special energy of

the company still may be directed to increasing the trade in cast goods. The inroads made on the stove trade by exclusive manufacturers of steel ranges have caused the manufacturers of cast goods to engage in the production of steel ranges in self defense. The number of steel ranges made during the past year is believed to have shown considerable growth as compared with previous years. The trade in steel cooking stoves, which is of more recent origin, has likewise been marked by rapid development during the year. More of the stove manufacturers added steel cooking stoves to their lines, and this form of construction now seems to have acquired a permanent footing. It had been supposed that the sheet steel air tight stove was an accompaniment of hard times, and that as soon as prosperity returned the demand for this class of stoves would show a heavy shrinkage. This, however, does not prove to have been the case. The trade in sheet steel air tights has been larger than ever, the manufacturers of such goods having secured their share of the increased business of the year. But it has been found that the trade will take a better class of such goods, and numerous manufacturers adopted decorative features or special improvements in design, which added somewhat to their cost. It appears that the air tight stove has so thoroughly demonstrated its usefulness in certain respects that the demand for this class of construction will continue.

CATALOGUE HOUSES.

Considerable complaint was heard during the year among the regular stove dealers relative to the inroads being made on their trade by catalogue houses in Chicago and at other points in the West. These catalogue houses advertised extensively, offering stoves and ranges to consumers at very attractive prices and on easy terms. They sold such large quantities that they were able to make favorable contracts with stove manufacturers, and thus secured extremely low prices. One of the large catalogue houses in the Northwest evidently extended its operations a little too broadly for its capital, and consequently went into bankruptcy during the summer with heavy obligations. Included among the creditors of this house were a large number of farmers and other patrons of the house who had forwarded cash to pay for goods ordered to be shipped to them. This experience has doubtless taught such buyers to be extremely cautious in dealing with establishments of this character. In some of the Western States the dealers placed themselves in a position to compete with catalogue houses. For instance, in a number of counties in Michigan they united for the purpose of buying stoves in carload lots so as to secure lower prices. These stoves were shipped to some central point, from which each dealer drew his quota of the shipment. They were thus enabled to make their customers as attractive terms as were offered by the catalogue houses.

EXPANSION OF MANUFACTURING OPERATIONS.

The excellent condition of the stove trade during recent years has contributed to the healthy growth of well established and well managed stove companies, and has likewise encouraged the establishment of new enterprises in this line. The trade is thus showing a state of gradual expansion, which speaks well for its future. Quite a number of new stove works of moderate proportions were started during the year. These new plants have developed in all sections of the country, thus showing that enterprise is by no means restricted to any one locality. Cities and towns which have long been the seat of operations in stove manufacturing have increased their importance in this line during the past year, and in some instances the expansion thus made has been decidedly marked. The growth in these cases has been due partly to the extension of operations by old companies and partly to the entrance into the field of new capital. No better evidence could be adduced of the healthy condition of an industry. It has been the fashion in some quarters to regard the stove trade as an industry of waning importance, but it is far from exhibiting indications of decay. Its growth is sufficiently vigorous to promise its continuance as an important branch of American industry.

LABOR CONDITIONS.

The stove trade was completely free from any disagreement with molders during the year. The usual conference occurred in March between the representatives of the manufacturers and of the Iron Molders' Union. This meeting was held in Chicago, and its deliberations were satisfactorily concluded on the 25th of the month. The scale adopted was the same as that prevailing in the previous year, and, as usual, was made to cover 12 months, beginning April 1. The provisions of this agreement have been carefully observed by both parties during the year, as had been the case, to the great credit of all concerned, for a long series of years. The relations with other classes of labor in the stove works have not invariably been so satisfactory. Frequent causes of friction developed from time to time, but proved serious in very few instances. It was usually found possible to adjust such differences without causing the suspension of operations. Occasionally a strike of polishers would cause some interruption to regular operations for a considerable length of time, but even in such cases it was found possible to make arrangements by which much of the necessary work would be accomplished. The stove trade was happily free from any labor difficulty which involved the trade as a whole or affected any considerable number of stove works. It is a cause of congratulation to the members of the stove trade that the management of their labor affairs is in the hands of capable as well as energetic men, who have the requisite tact and practical knowledge to enable them to speedily adjust such labor difficulties as will unavoidably present themselves from time to time. No branch of manufacturing activity is wholly free from labor troubles arising from a misconstruction of wages agreements or from attempts to correct fancied grievances.

THE CONSOLIDATION MOVEMENT.

Notwithstanding the failure of all previous attempts to accomplish a consolidation of stove manufacturing interests, another effort was made during the year to effect a scheme of this character. This time the attempt was made by a promoter in Detroit, who secured a number of options on stove plants without evidence of his success becoming actively manifest. The consolidation movement, however, has found sufficient favor to attract the attention and secure the interest of several prominent men in the stove trade.

NECROLOGY.

The stove trade lost quite a number of important members during the year. It will be observed that included in the following list are several men whose names have been identified with the stove business for half a century or longer:

William H. Dwyer, treasurer Peninsular Stove Company, died at Detroit, Mich., January 13, aged 38.

Frank B. Fox, manufacturer of registers and furnaces, died at Cleveland, Ohio, February 4, aged 64.

Charles M. Smith, general inspector Peninsular Stove Company, Detroit, Mich., and a veteran in the stove trade, died in February.

Gen. John F. Rathbone, president Rathbone, Sard & Co., Albany, N. Y., died March 20, aged 81.

Henry Reineke, president Reineke, Wilson Company, manufacturers of gas stoves, Pittsburgh, Pa., died April 14, aged 68.

Reuben R. Finch, vice-president Union Stove Works, Peekskill, N. Y., died May 15, aged 71.

Nicholas Brayer, president Co-operative Foundry Company, Rochester, N. Y., died in May, aged 72.

Joseph C. Henderson, stove manufacturer, Troy, N. Y., died May 10, aged 76.

David U. Cory of Uzal Cory & Co., furnace manufacturers, New York, died July 13, aged 52.

J. Leslie Miller, president Wm. Miller Range &

Furnace Company, Cincinnati, Ohio, died August 13, aged 59.

Chas. W. Adams, former superintendent Chicago Stove Works, died at Virgil, Ill., September 10, aged about 70.

W. M. Shaddinger, former second vice-president Detroit Stove Works, died at Chicago September 20, aged 49.

Geo. W. Walker, president Walker & Pratt Mfg. Company, Boston, Mass., died October 4, aged 74.

Josiah M. Read, pioneer Boston stove manufacturer, died at Everett, Mass., November 6, aged 92.

Theophilus H. Smith, formerly with Magee Furnace Company, died at Chelsea, Mass., in November, aged 84.

John F. Mills, vice-president Abendroth Bros., Port Chester, N. Y., died December 6, aged 58.

Wm. Cribben, Sr., for 20 years foundry foreman of Cribben & Sexton Company, Chicago, died November 21.

SOME HARD KNOTS IN FURNACE PRACTICE.

BY ANTI FRICTION.

It would be beneficial to every man who does hot air furnace work if he would read and study the suggestions in the article recently presented in *The Metal Worker* under the above head, for it contains many useful suggestions. Having had many years' experience in the furnace trade, I have come in contact with numbers of furnacemen who were in trouble, and seemed utterly ignorant of what to do to get out of it. All sought some key to a mystery, which they believed was locked up to them. Invariably I have resorted to an explanation of the very first principles—that is, that cold air, being heavier, falls and pushes the hot air out of its way, and that when in a confined space hot air must rise. This is exactly the condition in a hot air furnace. If there are no restrictions in the air space of the furnace, and no unnecessary obstructions in the air ducts, the air will rise. This may be said to be a fixed law of nature. Another statement that "hot air, like lightning, flows where it meets the least resistance," may be confusing, from the fact that the speed of hot air is much slower than that of lightning. That, however, is the only difference.

At the point where the air leaves the furnace and enters the pipe, there is room for a little study. If a tapering collar 1 or 2 inches long, and having a diameter 1½ or 2 inches greater at the point of connection with the furnace than the size of the pipe used, air would enter the pipes more freely. The pipe would be more nearly filled with air, and the air traveling through the pipe would have a greater velocity. This, however, is expensive, and it is improbable that many people will have their furnace work done on that plan. The suggestions as to location of registers are good. Some men are of the opinion that registers should be located on the outer wall, where, very naturally, there is a falling current of cold air. Other men believe that the registers should be near the inside walls, so that the air can flow from them with the least possible hindrance.

The ideas presented and the suggestions made show that a great deal of time has been spent in observation and study by the author, who, from his writing, seems to be an old furnaceman. The thoughts presented are sound, and can be digested by many younger furnacemen with decided advantage. Such suggestions from practical men in the business are beneficial to all who have opportunity to read it and should be an incentive for more furnacemen to occasionally take up their pencils and present their views where they will have the effect of benefiting the workmen and elevating the character of the work done to the mutual advantage of all connected with it.

Fred. W. Gardner.

The close of the year is usually the time when important changes are made in the management of manufacturing companies. We have grown into the habit of expecting something of this kind as regularly as the flight of time brings us to the month of December. This year announcement is made of a change of far more than ordinary interest to the stove trade. After a connection of fully a fifth of a century with the Michigan Stove Company, as Western manager, with direct charge of the Chicago house, Fred. W. Gardner retires to devote his attention to his private interests, which demand his personal care. This is a long time for a man to be identified with one company, in fact, so long that his name seems to grow into an inseparable connection with it. The period thus covered was one of continuous expansion in every respect. Mr. Gardner has been prominent in the development of the company's business in addition to managing his very important sales department, and he now retires at the end of the largest year's business the company have ever had. He preserves his connection with the company as a stockholder, and is thus deeply interested in its continued success, while the best wishes of his associates in the management follow him in his retirement.

Mr. Gardner has had a brilliant career as a stove man, and relinquishes his connection with the stove trade at a time when his abilities are most widely recognized. In the prime of life, better equipped than ever to grapple with the intricacies of business problems, it is hardly to be expected that he will long remain satisfied with administering his private affairs, even though they may now require absorbing attention. He will be heard from in some new field of usefulness in due season. That success may continue to crown his efforts is the earnest wish of his many friends throughout the length and breadth of the stove trade.

Round Oak's Annual Greeting.

The Estate of P. D. Beckwith, Fred. E. Lee, general manager, manufacturers of Round Oak stoves, ranges and furnaces, Dowagiac, Mich., favor us with a copy of their annual New Year's greeting. This is an exceedingly artistic publication, making a worthy addition to the fine list of similar publications previously issued. The pages are all inclosed in illuminated borders, and the printed matter covers only one side of each leaf, with the tops of the leaves uncut. The frontispiece is a representation of the famous Indian Doe-Wah-Jack lithographed in colors. The tail piece is a handsomely engraved view of the Round Oak Stove Works. The cover is a study in blue, heliotrope and gold.

The letterpress is an interesting presentation of the merits of the Round Oak line. Attention is, of course, first called to the Round Oak heating stove, which has now been before the trade for over 25 years, with its sales constantly increasing. The construction of this stove will not be changed this year. The malleable iron leg, added last year, proved a great success, practically doing away with all breakage. Consideration is then given to the Round Oak steel range and Round Oak standard cast range, which are of the highest class of range construction, and which are made and fashioned after the thorough Round Oak methods. These ranges will continue to be made as heretofore, with the addition to the steel range of a round rolling door to the warming closet and an independent cast iron base to the bottom, making it more substantial, improving its appearance and enabling it to pass through any ordinary house door.

The Beckwith Hot Blast will be a new member of the Round Oak family this year. This stove will have the famous Round Oak one-piece bottom with small ash pit door, which is a positively air tight draft door. It will also have a movable hot blast draft in the top with a new device for raising and lowering the tube so that the draft will be delivered on top of the fire. It will be mounted with Wood's 14-gauge cold rolled iron of the highest quality and with a nickel top ring, nickeled name plates on the malleable legs and a massive nickeled foot rail going completely around the stove. The Round Oak coal fixture will be used, having a rim discharge, preventing the formation of clinkers and securing perfect combustion. The Beckwith Air Tight will be made a much handsomer stove this year than last. Entirely new patterns have been made, which will be decorated with more and richer nickel work. The Round Oak furnace will continue to be made as heretofore with its great one-piece cast top, enabling the suspension of the three flues and cast radiator from this top, thus overcoming the upward expansion which is the cause of leaky furnaces.

TRAVELING STOVE SALESMEN IN 1902.

Black & Germer, Erie, Pa., have arranged with the following staff of traveling salesmen to represent them on the road in 1902 in the territory indicated:

N. H. Tighe in Eastern Wisconsin, Northern peninsula of Michigan and the city of Chicago.

T. J. Duffy, Jr., in Minnesota, North and South Dakota.

E. B. Waterman in Northern Iowa, Western Wisconsin, Minnesota and South Dakota.

D. J. Steele in Colorado, Kansas, Nebraska and Utah.

W. J. Farrell in Southern Iowa, Kansas and Oklahoma.

Arthur Corson in Illinois.

W. S. Jackson in Kentucky, Western Ohio and Southern Michigan.

Frank Thompson in Eastern Ohio and Western Pennsylvania.

D. E. Magee in Indiana, Western New York, Central Pennsylvania and Virginia.

The Ringen Stove Company of St. Louis, Mo., will be the company's Southwestern agents, and the O. K. Stove & Range Company of Louisville, Ky., their general Southern agents.

A Veteran Stove Manufacturer.

In a recent issue of the Louisville *Courier* is found an interesting biography of James S. Lithgow of the Lithgow Mfg. Company of that city, who is now in his ninetieth year. It was just 70 years ago, on December 13, that Mr. Lithgow landed at the wharf at the foot of Third street, in Louisville, to begin his business career. He was born in Pittsburgh, Pa., on November 29, 1812, and had just completed his apprenticeship as a tinner when, in 1832, General Jackson vetoed the United States Bank bill, which paralyzed business in Pittsburgh and elsewhere. His employer entered the shop the day the news reached Pittsburgh and announced what had happened, and, being an enthusiastic Whig, notified the entire force that the country was ruined and that the shops would be indefinitely closed. Mr. Lithgow immediately announced to those present that he was going West, and on the following Sunday morning took passage on the steamer "Boston," which landed him in Louisville, Ky., on Friday morning, December 13, 1832.

Without means, he started out early to look for work, and on the morning of the next day went to work for Bland & Coleman, who ran a tin and sheet iron shop. Subsequently he found employment with Andrew Barnett, who sold stoves and operated a tin shop. His next employment was with Hicks & Taylor. During this employment he became acquainted with Allen Wallace, a fellow workman. During this time James & William McCrum, who were large hardware dealers and handlers of tin plate, had come to know both the young men, and, impressed with their industry, honest bearing and trend for business, suggested to Mr. Lithgow that he and Mr. Wallace go into business on their own account, agreeing to supply them with tin plate and await its being made into ware and sold before payment, and to aid them otherwise financially.

In 1836 the firm of Wallace & Lithgow were organized. By industry and strictest integrity the firm became one of the most prominent and successful in what was then known as the West. Being successful they early established a stove foundry, and in this business—nearly 70 years now—Mr. Lithgow is yet engaged, the name of the concern having been changed some time back to the Lithgow Mfg. Company.

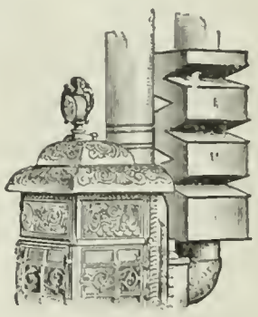
Perhaps no man ever lived in Louisville who was more esteemed or more universally loved than Mr. Lithgow. He has never sought office, although he has at times been forced to serve in official capacity. He was a member of Council and Alderman, and without formal consent was nominated and elected Mayor. Mr. Lithgow has always been a stanch member of the Methodist Church and has supported it with a liberal hand.

E. C. Hanrahan.

E. C. Hanrahan, manager of the Chicago house of the Peninsular Stove Company and one of the most able men in the stove trade, has resigned that position and intends to take a long needed rest. Mr. Hanrahan has been connected with the Peninsular Stove Company for the past nine years. During that time he has had the gratification of seeing the company's business grow to nearly three times what it was when he became associated with them. Prior to this term of service he had been secretary and treasurer of the Schaab-Hanrahan Stove Company of St. Louis, and previous to his connection with that company he had been for many years in the employ of the Bucks Stove & Range Company, also of St. Louis. Mr. Hanrahan has been a hard worker for nearly 30 years, during which time his attendances at stove conventions have been his only vacations. He has been fortunate in accumulating a competence, enabling him at this time to take his ease, and he has therefore decided to retire from the activities of business life. While this is Mr. Hanrahan's present intention, it is the judgment of his friends that, as he is still a comparatively young man, it will not be long until he finds that he has had sufficient relaxation and will feel inclined to again become connected with some active business. He has a wide circle of friends in the stove trade who will regret to hear of his withdrawal from their particular field. Their best wishes will go with him in whatever direction his inclinations may hereafter take him.

The Edgar Radiator.

A considerable amount of heat that otherwise would be lost in the chimney is utilized with advantage by the attachment of a drum or radiator to the smoke pipe



The Edgar Radiator.

of cooking and heating apparatus. In the accompanying illustration we present a view of the Edgar radiator, manufactured by the Welliver Hardware Mfg. Company, Danville, Pa., as used in connection with a parlor heater. This radiator may be attached to the stove pipe and used in the same room with the stove; or, by running the smoke pipe through the wall, in an adjoining room; or, by running the smoke pipe through the ceiling, for heating an upper room. The radiator is made 20 inches high and 9 inches square, and is adapted for 5½ or 6 inch pipe. It is pointed out that the draft is not seriously affected by its use, and the fact that an additional room may be appreciably warmed without burning additional fuel shows that considerable heat is saved from waste and that the radiator is adapted for varied uses. The company issue a circular presenting a number of illustrations showing the various adaptations of the radiator to use.

In keeping with their annual custom the Schill Brothers' Company, Crestline, Ohio, are sending to their friends in the trade a souvenir of the new year in the shape of a calendar with a greeting for 1902. The calendar bears a fine reproduction in colors of a painting by a noted artist entitled "The Raffle." It serves as a pleasant reminder of the Stoves, Furnaces and Ranges made by the donors.

Radiant Home Stoves and Ranges.

We have received from Black & Germer of Erie, Pa., a copy of what is known as "Catalogue E," relating to the Radiant home stoves and ranges, which they manufacture in great variety. Special attention is called to the Radiant Home steel range fitted with the manufacturers' patented air blast linings, by the use of which it is claimed 45 per cent. less fuel is consumed than in cases where these linings are not employed. The linings are warranted for five years, and in connection with a detailed description of their construction a broken view of the fire pot is presented, showing the manner in which the linings are applied. The steel range has a hammered, polished body, a double flue bottom, thus preventing chilling of the oven; double latched spring oven door with malleable iron hinges, removable duplex grate, which when reversed forms a wood grate, and an all cast removable reservoir attachment, which fits all sizes. The range is made in a number of styles and sizes and is adapted for burning as fuel either hard or soft coal, lignite or wood. The cast ranges, which are offered under the name Radiant Home, embody features of construction and ornamentation which have established for them a very gratifying reputation in the trade. The leading place among the heaters is given to the Radiant Home base burner, made in several sizes and offered both as a single and a double heater. The ornamentation involves the judicious use of nickel, while ample mica illumination gives to the stove a brilliant appearance when in operation. Other heaters include the Radiant Home Air Blast, with steel body and also with cast body; the Radiant Home Parlor and the Radiant Home oval wood heater. The catalogue concludes with reference to Radiant Home furnaces, repair lists, index, &c.

ODD PLATES.

A SLIGHT fire occurred on December 28 in the Stove works of Rathbone, Sard & Co., at Albany, N. Y., which resulted in a damage of about $5000. The plant was closed on that day for inventorying and will be reopened in ten days, when the slight injuries resulting from the fire will have been repaired and the works be running as usual.

C. W. REALS has severed his connection with the Keeley Stove Company and during the coming year will represent the Brand Stove Company of Milwaukee, Wis., in Ohio and Michigan.

THE BUCKWALTER STOVE COMPANY, Royersford, Pa., have favored us with one of the handsome embossed calendars for the year 1902 which they are sending among the trade. It is one of the most attractive sent out by the above company for several years, and will no doubt be appreciated by those fortunate enough to receive it.

"THE SUNSHINE STOVE SHOP," Orr, Painter & Co., Reading, Pa., have favored us with one of their pad desk calendars for 1902. Besides its usefulness as a calendar, sufficient space is provided for memoranda. Each page has the announcement of the company at the top, with mention of their various lines of Stoves, Ranges, Furnaces and Heaters.

IT is reported that the Avondale Stove & Foundry Company of Avondale, Ala., have purchased a site and will erect an additional plant to cost $50,000.

ROBERT L. MORLEY, who has for many years been associated with Fred. W. Gardner in the management of the Chicago house of the Michigan Stove Company, was promoted to the position of manager on January 1. The associate manager is J. B. McKewon, who has been connected for a number of years with the Chicago Stove Works as sales manager.

A KINDLY recollection of John E. Gaitley will come to all who receive the neat vest pocket calendar and diary that is being distributed by the Troy Nickel Works, Albany, N. Y. The useful information it contains on such subjects as postal rates, &c., and the maps of the United States territory is amplified for the use of the Stove trade by cuts and descriptions of some of the well-known Alaska Stove Furnishings. The front page of the leather cover is adorned with the Alaska trade-mark in gilt.

THE CHARTER OAK STOVE & RANGE COMPANY, St. Louis, Mo., have favored us with a copy of an illustrated almanac for 1902, which they are distributing to the trade. This almanac presents a variety of contents which will make it acceptable to housekeepers generally. In addition to the usual calendar giving astronomical information for each month, it contains an astronomical chart, forecasting the weather through the entire year. It further presents reproductions of pictures by famous artists and a great deal of interesting miscellany. Interspersed through the contents are illustrations of leading products of the company. It thus comprises in one publication the features of a catalogue as well as an almanac. The arrangement of the contents reflects great credit on the compiler.

FULLER & WARREN COMPANY, Troy, N. Y., have favored us with a copy of the handsome calendar for 1902 that they are distributing among the trade. The monthly sheets are printed in bold figures upon paper of soft tones, with a different color for each month. The sheets are mounted on a gilt card, 11 x 14 inches, bearing in brown lettering the name and address of the company and a reference to their Stoves, Furnaces and Ranges.

HENRY CHATFIELD, who has represented the Standard Lighting Company of Cleveland, Ohio, in New York State during the past six years, will this year look after the interests of the Monarch line in that territory. Mr. Chatfield will represent the goods of the Monarch Stove Company of Mansfield, Ohio, including the Monarch Wickless Blue Flame Oil Stoves, Monarch Gasoline Stoves and Monarch Asbestos Lined Ovens, among the trade in New York State for 1902, doing so under the management of the company's New York office at 284 and 286 Pearl street.

THE CHILSON FURNACE COMPANY of Boston and Mansfield, Mass., are distributing a large sized hanging calender, having the date sheets attached by silk cords to a card on which is a picture of the company's Standard Arlington Range with the name and address of the makers in white on a dark green ground.

A HANDSOME CALENDAR for the new year reaches us from the Phinney Stove Company of 1530 Market street, San Francisco, Cal., who are extensive dealers in Stoves and Ranges, and carry in stock a varied assortment specially adapted to the needs of the Pacific Coast. The main feature of the calendar is a sweet faced young girl set in a framework of violets and gold decoration. The coloring is rich and striking. White scrolls at the right and left, attached by a ribbon of delicate hue, carry the name and address of the company with an indication of the line of business in which they are engaged.

THE CHICAGO STOVE WORKS, Twenty-second street and Blue Island avenue, Chicago, have furnished us with the following list of traveling salesmen who will represent the company in 1902: J. R. Barse, Minnesota and North Dakota; Fred. P. Bloom, Ohio and Indiana; P. J. Coppens, Michigan; Frank H. Leevy, Southern Iowa and Northern Missouri; W. T. Griffith, Wisconsin; F. P. McCarty, Illinois; L. H. Riffel, Nebraska; J. T. Sandven, Western Iowa and South Dakota; W. V. Townsend, Kansas and Oklahoma; W. W. Wilson, Northern Iowa; John F. Cady & Brother, Chicago and suburban towns.

THE annual meeting of the stockholders of the Pennington Foundry & Heater Company, Pennington, N. J., was held last week. The annual report showed the company to be in a flourishing condition financially. The following officers were elected to serve for the ensuing year: Frank Le Bar, president; M. B. Moore, vice-president and general manager, and J. S. Burd, secretary and treasurer. The directors are O. B. Gray, J. R. Bergen, H. R. Sheeler, E. S. Wells, Frank Le Bar and M. B. Moore.

WORK has been begun on a new foundry for the Novelty Stove & Mfg. Company, at Savannah, Mo., to cost $10,000.

THE CALDWELL FURNACE COMPANY are remodeling the plant of the Alabama Hardware Company, at Fort

Payne, Ala., in order to adapt it to the manufacture of Furnaces and Heaters for large public buildings and Iron Mantels and Grates. The building is a substantial three-story brick structure, and was already equipped with a foundry plant when purchased by the Caldwell Company. The necessary alterations will be completed very shortly and the plant immediately put in operation.

The Eagle Steel Range Company of Shelbyville, Ind., have finished the erection of a new building, 50 x 120 feet.

The foundry and Stove plant of Moore Brothers, at Wichita, Kan., is about to be extended by an addition which will about double its capacity.

William R. Yendall, Jr., has been appointed Western manager of the Peninsular Stove Company, with headquarters in Chicago, to succeed E. C. Hanrahan. Mr. Yendall had been assistant manager for five years, and has been connected with the company for a period of 11 years. He is, therefore, thoroughly familiar with the company's line. He also knows the trade intimately, and is therefore well qualified to fill the duties of his new position creditably.

The Detroit *Tribune*, Detroit, Mich., in an article calling attention to prominent business men in Michigan, who would make excellent timber for positions in the cabinet of the President, mentions Fred. E. Lee of Dowagiac. Mr. Lee is well known to the readers of *The Metal Worker* as the general manager of the Estate of P. D. Beckwith, manufacturers of Round Oak Stoves and Ranges. The idea of calling to prominent position in affairs of State men who have displayed genius for the successful management of extensive private enterprises seems to be gaining ground steadily with the people. Mr. Lee has been prominently mentioned for Governor of his State, a seat in the Cabinet and other positions of responsibility and trust. His qualifications for such service to the public, as shown by his management of the great interests which have come under his care, are of the highest order, and if he should be selected for such a position he would undoubtedly fill it with great credit to himself and to the trade in which he occupies so prominent a place.

Arthur H. Lovejoy, who has represented Isaac A. Sheppard & Co. for the past nine years in New Jersey, New York and New England, will represent in New England in 1902 the Fuller & Warren Company, Troy, N. Y., giving special attention to their Stove and Furnace business. Mr. Lovejoy is a practical mechanic and furnaceman of long experience, having paid special attention to the heating of public and private buildings. He has many qualifications that should aid him in making a success with the extensive line of the Fuller & Warren Company in the New England market.

The American Stove Company, recently incorporated under the laws of the State of New Jersey, have increased their capital stock from a nominal figure to $5,000,000.

We are advised that suit was brought on December 16 in the United States Circuit Court for the Eastern District of the State of Michigan by William T. Black and Otto Germer of the firm of Black & Germer, Erie, Pa., against the Art Stove Company of Detroit, Mich., for an alleged infringement in the manufacture of the fire pot of the Twentieth Century Art Laurel. Black & Germer warn the trade that the fire pot used in the Stove named is not of their manufacture.

The Galusha Stove Company of Rochester, N. Y., are distributing among their friends in the trade a folder printed in colors and entitled "A Burning Question." It is addressed more particularly to dealers, and calls attention to the merits of Norman Stoves, which are referred to as being made of the best materials and as being easy to sell. Illustrations are presented showing the Norman Steel Range, the Norman Oak and two styles of Parlor Heaters richly ornamented with nickel.

The Reading Stove Company of Reading, Pa., are sending out a neatly printed four-page folder calling attention to the fact that since their 1901 catalogue was issued there have been several additions to the Sunshine line, and some changes in lists. Some of the more important of these changes and additions are enumerated, and accompanying the folder is a handy price-list of things made at the "Sunshine Stove Shop." This price-list consists of 60 pages and covers all the leading lines manufactured by the company named. The matter is arranged in such form as to be of special convenience to the dealer, and in connection with the dimensions and prices are code words which will be found advantageous for use when ordering goods by wire.

The foundry of the Keeley Stove Company, at Columbia, Pa., shut down on Thursday, December 19, for annual inventory and repairs. We understand that operations will be resumed on Wednesday, the 8th inst.

Combination Egg Cup and Cutter.

The Edmonds-Metzel Mfg. Company, 778 to 784 West Lake street, Chicago, have just brought out the Combination egg cup and cutter herewith illustrated. It is intended for table and kitchen use, for handling eggs neatly, whether raw or boiled. It makes a clean cut through the shell and avoids holding the egg in the hand. The device consists of three parts, which are lettered in the accompanying illustration. The egg is

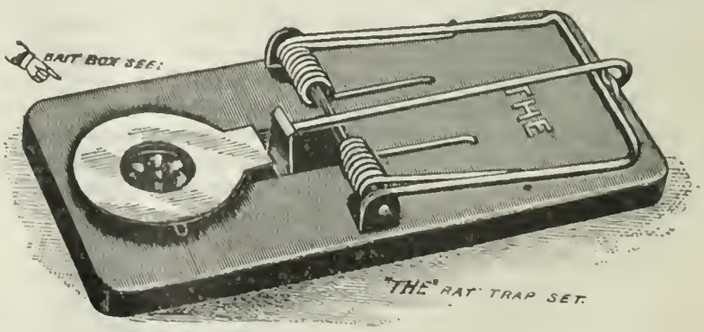


Combination Egg Cup and Cutter.

placed in the holder C, with the small end down. It is next covered by the cap B, which is firmly pressed on the top of the egg and has three needles or projections at equal parts of its circumference which pierce the shell. The cover A is then set on top. This cover has a knife blade, which is forced into the shell, and, the cover being revolved, makes a clean cut through the shell, enabling the top of the shell to be lifted off.

"The" Rat Trap.

J. K. Osborn Mfg. Company, Harrison, N. J., for whom John H. Graham & Co., 113 Chambers street, New



"The" Rat Trap.

York, are selling agents, have just brought out "The" rat trap here illustrated, which in its general character resembles the mouse trap previously introduced. The

base is stamped from sheet steel, gray enameled, and is 3½ x 7 inches in dimensions. The bait box is a concavity for holding the bait beneath the movable pedal, so that the animal must spring the trap in getting at the bait. The coil springs and square loop are of strong coppered steel wire. The traps are packed 12 in a pasteboard box, and 12 boxes, or one gross traps, in a case.

WHAT TO DO IN JANUARY.

BY H. C. W.

The first month of all the 12 to follow—the month of new resolutions—the month of changes and that one which decides for us the result of the inventory as to whether we have made a dollar in the business or see staring us in the face the fact that we have lost many of them.

After closing inventory books, after the dividend, if any, and after closing every possible account on the old books, it is a good time to get ready for

THAT NEW SET OF BOOKS AND COLLECTIONS.

No time is quite so good as the first of the year to start the clerical department entirely new, as to material to be used. There are many good reasons for it. In the first place every one expects to pay his debts, if he pays at all, at that time. It is more convenient for him—as a rule he has more money, and he well knows it is expected of everybody.

This season should lessen by almost hundreds the number of accounts to go into your transfer to a new and clean ledger, and a little printed paster slip put on your statement, to the effect that you are changing, will aid greatly in the collection of them. Something like this, which the writer has used to good advantage:

The New Year is at hand, we expect to open an entire new set of books; will you very kindly help us in this by favoring us with amount of above account?

Many people who would not ordinarily respond, knowing and appreciating the attending labor, will make it a point to see the account paid.

Now, as to your books. If possible at all have them made to suit your wants, particularly ledger and cash book. Many bookkeepers and many proprietors prefer special ruling of ledger, and it costs no more than to buy made up or shelf goods.

In a special column cash book—that is, one in which the columns are ruled for Freight, Drayage, Interest and Discount. Merchandise, Expense, &c.—a great saving in time is made and endless waste of pages in the new ledger are avoided. The matter of simplifying and shortening is a great item where many accounts are carried.

JANUARY THE TIME FOR CHANGES.

There are frequent changes in firms at this season, but the minor changes in store room and arrangement are more particularly referred to. You have, perhaps, more time at your command during the first two weeks of this month for such work than at any other season of the year. It is neither pleasant to the eye nor profitable to keep the same arrangement of your store running from year to year. The appearance of the store must be the loadstone to attract, and customers tire greatly of an everlasting sameness, and are very liable to make the assertion that you are drifting into what is termed old fogyism.

It costs so little to change the arrangement, the placing and filling of showcases and to add new ones where and when needed, and practically just as little for fresh paint and bright, attractive shelving. The addition of a wall case occasionally adds wonderfully to the appearance of a room. Let every effort that is made in this line tend toward the showing of more goods and making the silent salesman. A line of goods such as Hammers and Hatchets or Saws will sell themselves when exhibited in a case, while on the other hand customers will not ask for them under any circumstances unless their errand be directly for that article.

A NEW SET OF RULES

for employees, if your old ones do not meet your views or have not been observed as they should be, or perhaps you have gone along without any.

Men do not object to sets of rules in a store unless they be extremely arbitrary ones—on the contrary, they prefer working under a system that tells them when and where and what to do without the continual asking, and beyond what their own intuition would dictate.

In the case of but two or three employees it may be thought not worth the trouble, but the writer assures you that few or many sensible right lines laid down for their direction are appreciated by the men themselves and the results are greater and much better than where none at all exist.

A little system is a help to the green man and a law to the older one, saving proprietor, too, many moments of anxious worry during the day.

HOW ABOUT ADVERTISING?

Has yours been a success during the past year? Have you bought space and handled it as you would the buying of goods you put on your shelves? Do you get more out of locals than you do out of display, or have you watched the results of either?

Are you using good cuts or putting up the same old ones you have had for years? Do you make frequent changes, and do you confine yourself as nearly as possible to one line of goods in advertising, or jumble many together? In the latter case of course the real object of your work is lost sight of and much of it goes for naught.

We should ask ourselves fairly and honestly these questions and look the matter of our advertising squarely in the face. More money is thrown in the fire through poor advertising and little attention to it than any of us can estimate.

Do you advertise at all? Many Hardware merchants do not. If not, get at it and see the difference in your business. You will wonder where all the barnacles came from that will drop away as you sail along with increased trade.

MONEY IN NEW LINES OF GOODS,

and there is money in them. January is a good time to decide what they are to be. It's very much like your old shelving and your showcases that are never changed as to arrangements and contents; people get tired of seeing them, and in these hustling days are looking for new lines. You will have had continual calls for some one class of goods you do not carry—perhaps House Paints, Box Paints or Brushes—all profitable goods, perhaps more so than you imagine. It takes but little capital to add them, and in doing so it is not necessary to sell the worthless Paints—the man who doesn't pay his debts is a part of every class of trade. You will find there are great quantities of these lines you have not carried, sold all the time and at a good profit and for cash.

Enameled or Gray or Blue Ware is a great seller. Hollow Ware is good, Carpet Sweepers, Fishing Tackle and Sporting Goods in a small way. Put in lines that competitors don't handle; there are any number of them and they attract customers.

LEST WE FORGET,

and what should be the first thing in the new month, don't neglect to see the carried over holiday goods, that positively do not sell during the year, put away safely and put away dust proof and dirt proof. For a great many goods paper bags are capital for this. Some of it can go along through the month with the chance of selling it, but the time comes for Fire Irons, Brass Sets, Candelabra and Candle Sticks, Brass Fenders, Brass Hods and all the smaller pieces of plated, brass and bright goods, and their value gets away unless properly wrapped and bagged and packed in a clean, dark corner.

START WITH A CLEAN STORE.

This month and the new year should see every part of the store spick and span and clean as clean can be. Of course, the inventory helps much if carried through rightly, but all of us do not clean up thoroughly as we go, while it is a fact that every man doing calling off should have a brush or feather duster near at hand, and not depend so largely on an after going over, for which time and opportunity may never come.

It is wonderful the amount of filth, &c., that gathers during the year on shelves, in boxes and throughout

every corner of a Hardware store, and the time to clean up rightly is early in the first month of the year.

THE OPPORTUNITY FOR CLEARING DEAD STOCK

is in January. No other month gives you the same, and in no other month of the year, perhaps, is there as much time to give to it. If inventory has been rightly taken it has developed all the worthless and unsalable goods in the house. It now remains for us to get rid of them, and with many this is a sort of nightmare, while properly handled and displayed it is not a hard job at any time. Give them a table of their own; show them at their best, with a price that will move them, and if that price don't do it give them another. Lump them off to contractors, shop men, factories or what not. Sell them at some price, and you will have done the best job of the month, leaving you in good shape for the 11 months to follow.

Side Cutting Long Nose Plier No. 622.

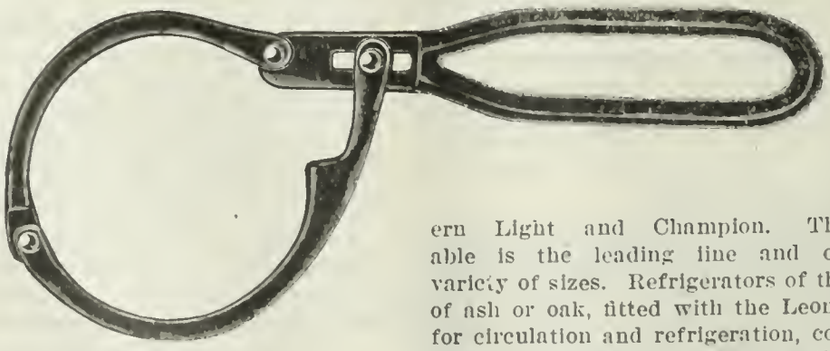
The Smith & Hemenway Company and the Utica Drop Forge & Tool Company, 296 Broadway, New York, are putting on the market the side cutting long nose plier herewith illustrated. The advantages claimed for the plier are that having a long narrow nose it can be used in deep, narrow quarters in which an ordinary tool would not work; that it will do the work of a regular tool and that it is convenient to carry. Every tool, it is remarked, is carefully tested at the factory before being sent out. The plier is referred to as being adapted to the use of telephone manufacturers, machinists, engineers, electricians and jewelers.



Side Cutting Long Nose Plier No. 622.

The U. S. Mason Jar Wrench.

C. A. Powell, 387 Kinsman street, Cleveland, Ohio, is offering the Mason jar wrench herewith illustrated. It is described as being constructed on the lever principle, designed to give an absolute grip and an equal pressure around the cover by means of an adjustable device. The handle is so connected to the claws or rings, it is explained, as to compress them with just sufficient force to overcome any tendency to slip, and yet not grip the cover with more pressure than is necessary, thus obviating the risk of cracking the glass or crushing the cover. It is pointed out that the wrench grips the cover around the top, so that the pressure is sustained by the glass disk, making it impossible to crack or break the jar. It is claimed that with the wrench a jar can easily be sealed air tight, and that no matter how tightly the cover may stick, it can be easily removed without prying under it with a knife.



The U. S. Mason Jar Wrench.

The Eureka Step Ladder.

The step ladder shown herewith is offered by John S. Tilley, Watervliet, N. Y. The ladder has a special style of hinge, connected front and back, bolted on, rodded and well braced with iron braces. The ladder is also made with the open back, as shown in the detached cut to the right, which is preferred, it is stated, by most painters, as it admits using a plank to make a platform more readily. The ladder is also made with a pail rest. The manufacturer explains that the ladder is particularly adapted for painters, carpenters, fruit pickers and mill use, or in fact wherever a durable step ladder is required. It is pointed out that the ladder fills all the requirements of a first-class article, and is not cumbersome. It is made in eight sizes, from 5 to 12 feet, in even foot lengths.



The Eureka Step Ladder.

Grand Rapids Refrigerator Company.

Grand Rapids Refrigerator Company, Grand Rapids, Mich., have issued a new season's catalogue of the Refrigerators manufactured by this company under the names of the Leonard Cleanable, Northern Light and Champion. The Leonard Cleanable is the leading line and consists of a great variety of sizes. Refrigerators of this style are all made of ash or oak, fitted with the Leonard patented system for circulation and refrigeration, constructed with eight separate and distinct walls protecting the contents from the outside air, and have the Leonard patent Refrigerator lock, the Leonard patent method of interior construction, the Leonard patent ice rack, the Leonard patent sliding adjustable shelves and the patented method of enabling the entire interior to be removed to permit the flues to be washed. The Leonard Cleanable also includes numerous elaborate sideboard constructions. A number of sizes are furnished with a lining of genuine porcelain instead of zinc. The Northern Light line is provided with a removable ice tank among other special

features. This line is made in special styles, comprising the standard sizes. The Champion line is more extensive than the Northern Light, and is presented to the trade as a well made Refrigerator at a lower price than the Leonard Cleanable.

The American Rotary Washer.

The accompanying cut represents a washing machine offered by the Bluffton Mfg. Company, Bluffton, Ind. The motion is referred to as a departure from all other rotary motions. The gear is represented as the strongest leverage known and the operation of the washer as the easiest. Strain of castings is not known in this gear, it is remarked, hence breakage is eliminated. The machine has a locking hinge gear, which locks it when open or closed. When opened the gear raises the lid, bringing it to a position far from interference with loading or unloading the machine, and giving ample room for use of the wringer. It is pointed out that the speed is fast



The American Rotary Washer.

and that the rotation of the pin wheel is with a large sweep, causing great agitation of the water, which is the factor that cleanses clothes. The manufacturers state that the machine is of the highest quality throughout and the finish of the best.

North Star Refrigerators.

The Indiana Mfg. Company, Peru, Ind., are sending out catalogues of the North Star refrigerators. One of these catalogues, consisting of 56 pages, presents illustrations of the full line, comprising constructions intended for every requirement of domestic use, beautiful sideboards and large sized refrigerators for grocers, butchers, &c. The North Star Refrigerators embody an efficient method of securing the circulation of air, and the insulation is accomplished by a combination of dead air space and granulated cork. These Refrigerators have seven walls. The ice rack is of new design and made entirely of galvanized steel. The trap is ingeniously constructed to serve the purpose for which it is designed. A portion of this catalogue is devoted to the illustration of tile lined Refrigerators, the company making a very complete line of this class of Refrigerators. Several pages are used in presenting illustrations of the Indiana hard wood Refrigerator, which is a first-class construction furnished at a lower price. A second catalogue treats exclusively of tile lined Refrigerators. The illustrations of this catalogue are of a specially high order of merit. The shelves, pipe, top of provision chamber and door bindings of these Refrigerators are finished with four coats of enamel thoroughly baked on. Shelf tiles are used for shelf supports, making a very much better finished interior.

The Twentieth Century Tack Pullers.

The Henry & Wright Mfg. Company, Hartford, Conn., are offering the tack pullers shown in the accompanying



Fig. 1.—Twentieth Century Tack Puller No. 1.

illustration, which are one-half the actual size of the goods. They are designed to overcome certain imperfections which are referred to as existing in wooden handled pullers. The handles of the pullers illustrated are made of iron with japanned finish. The hardened jaws of the pullers are firmly riveted to the handles, thus making them practically unbreakable, if used only for pulling tacks. It is pointed out that they also have the advan-

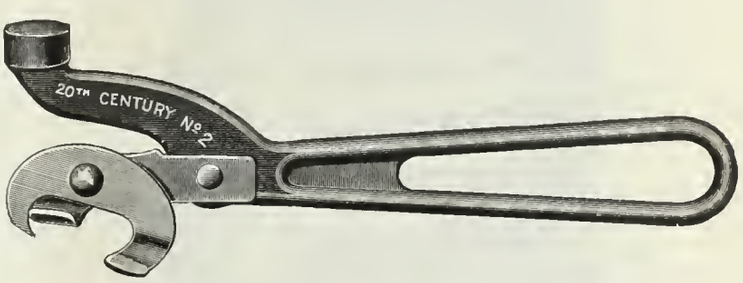


Fig. 2.—Twentieth Century Tack Puller No. 2.

tage of taking up little space, and that they are light enough to make them convenient articles for mail order trade.

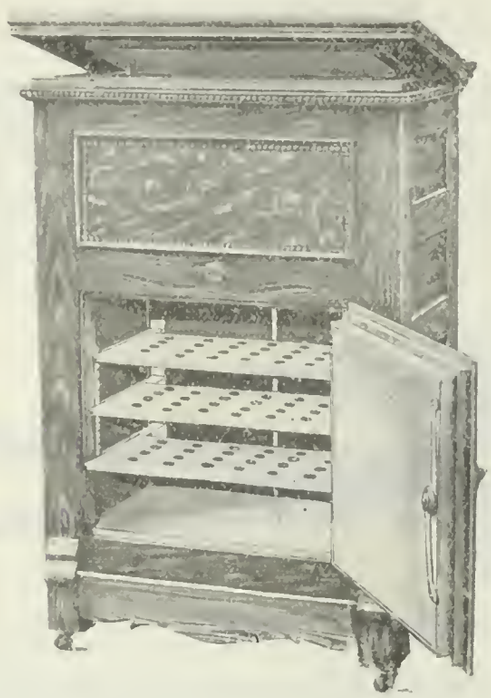
The Adams & Elting Company.

The Adams & Elting Company, manufacturers of Paints, Chicago, have brought out three interesting catalogues descriptive of some of their Ad-El-Ite specialties. One catalogue treats of Iron Bedstead Enamels, showing samples of 21 tints. These Enamels consist of Art Lacquers of dead finish and Enamels of gloss finish. The Lacquers are stated to dry perfectly hard in half an hour, presenting a finish which cannot be chipped, washed off, nor glossed up with rubbing. The Enamels are furnished in many tints and cover thoroughly in one coat except the very delicate tints, which require two coats. These Enamels dry perfectly hard in 12 to 14 hours and can be baked at 150 degrees. The second circular relates to tinted Enamels, which are shown in 18 tints and are adapted for application to any surface, such as walls, furniture, iron beds, radiators, lawn chairs, or interior finishing of houses. The third pamphlet is intended for the information of consumers of Paints and gives many practical suggestions how to refinish the interior and exterior of a home and improve the appearance of the contents generally by the use of the Ad-El-Ite specialties.

Sidney, Shepard & Co., Buffalo, N. Y., are distributing a leaflet illustrating and describing their Perfect Galvanized Washtubs with corrugated steel wringer attachment; also their Gilmore Grater, which they claim will not clog, because from the shape of the perforations, the article to be grated is cleanly cut, and the cuttings drop through directly without lodging in the holes.

The Leonard Sliding Adjustable Shelves.

An illustration is presented herewith of a new feature which has been incorporated in the Leonard Cleanable Refrigerators by the Grand Rapids Refrigerator Company, Grand Rapids, Mich. The company state that for 20 years they have felt the necessity for a sliding adjustable shelf, but had never been able to make it until this arrangement was devised. Sliding shelves have been arranged in ovens and adjustable shelves in bookcases, but until this time a sliding shelf has not been brought out which is also adjustable to any hight without the aid of tools. By means of this new arrangement any one can place the shelves at any desired hight in the refrigerator by simply changing the guide strips from one slot to another. They are not fastened by screws or locks of any kind. The close adjustment enables extra shelves to be



The Leonard Sliding Adjustable Shelves.

inserted for small articles, such as pies, thus increasing the capacity of the refrigerator by one-third without extra cost for the additional space.

Stove and Hardware Dealers.

Curtis & Wellington have moved into their handsome new quarters at 366 Stratford avenue, Bridgeport, Conn. The new building is carefully planned and fitted up to meet their requirements. On one side of the store is a display of Cooking Ranges, House Furnishing Goods and Agate Iron Ware. On the opposite side is a sample room of the Thatcher and Boynton Hot Air Furnaces. In the rear of the office is a fine showroom fitted up for the display of Plumbing Fixtures. The building extends back to a driveway over which there is a shed, so that teams can unload directly into the shed. The shops are in the basement equipped with benches and machinery for sheet metal work, plumbing and steam and hot water heating.

Hardman & Leatherman and Shirley Bros., Orleans, Ind., have consolidated their interests under the style of the Orleans Hardware Company, who have been incorporated under the laws of Indiana. The line carried by the company embraces Hardware, Implements, Stoves, Building Material, Wagons, Buggies, &c.

Frank L. Jones, Utica, N. Y., has issued a new pricelist of apparatus, supplies and specialties for cheese factories, creameries, dairies, milk stations, milk dealers, &c., of which he is manufacturer.

The Winfield Mfg. Company, Warren, Ohio, are distributing a circular illustrating and describing their Anchor Sap Spout, which they have been making for 15 years.

Maine Mfg. Company, Nashua, N. H., have prepared an attractive poster calling attention to their White Mountain Refrigerators. The company are prepared to furnish the posters in liberal quantities to their customers, printing firm name and address in the margin at the bottom.

Randallman & Sons, manufacturers of the Gee Whiz Washing Machines and Wooden Novelties, Des Moines, Iowa, will erect a new building early the coming spring, which will double the capacity of the plant. The factory was located in Des Moines a year ago, and the business of the company has been steadily growing since then.

A tasteful wall calendar has reached us from the Grand Rapids Refrigerator Company of Grand Rapids, Mich. It consists of an artistic picture of red and yellow roses in a bowl, displayed on a golden ground and having small calendar sheets attached to the bottom, the whole presenting a fine decorative effect. An unusual feature of the calendar is the fact that the front part contains no advertising matter whatever, not even the name of the concern being printed upon it. All the advertising matter is at the back, and consists of illustrations of the new Leonard Cleanable Refrigerator for 1902, closed and open, with a description of the merits of this article. The Refrigerator is offered in two styles, one zinc lined and the other lined with porcelain. The company note that their new catalognes for 1902 are now ready, and that they will be glad to send a copy to any one in the trade who has not yet received one.

An interesting decision was recently handed down by the Recorder of the city of Leeds, England, in a case brought against an employee for the alleged theft of trade secrets. The man in question was charged with stealing eight acetylene gas burners and other property belonging to his employers, who are the patentees and manufacturers of the burners. The man had been in the employ of the prosecuting firm for three years, and there was an unwritten understanding that he was not to divulge any of their trade secrets. He left their service, and entered that of a rival firm in Scotland, taking with him, without consent of his former employers, certain articles which he had used to carry on in his new employment a process identical with that used by his original employers. The prisoner affirmed that he was simply experimenting with the appliances which he claimed he had removed by inadvertence. The Recorder, in passing judgment, said that the issues of the case were of the utmost importance to the commercial community. A man might steal his employer's brains, but he could not legally take away his property against the employer's will. The prisoner, being found guilty, was sentenced to nine months' imprisonment at hard labor.

Evans Stamping & Plating Company, Taunton, Mass., have purchased the entire plant of the Draper Williams Mfg. Company, manufacturers of Oil Cans and Awls. The Evans Company have moved their steel making department, which was formerly in the Taunton Iron Works, into their new plant, and will continue the manufacture of Nickel Plated Steel Stove Trimmings, which they have been making for the past four or five years. They are also getting ready to manufacture an Oven Thermometer, for which they have secured the patent rights. They will probably be ready to put this Thermometer on the market about February 1. They also intend to manufacture a full line of Stamped Steel Hardware, including Oil Cans.

Frederic G. Dow, who was a director of the American Stove Board Company and of the U. T. Hungerford Brass & Copper Company, and was also interested in a number of other industrial corporations, died on December 28, at his home in New York City, aged 51 years.

In addition to practically monopolizing the ice business of the East, the American Ice Company, it is said, are planning to enter the coal business on an extensive scale. The concern evidently want to get all that there is going both winter and summer.

THE PROTRACTED ACTIVITY IN THE IRON TRADE.

The iron trade is now entering upon its fifth year of activity. It will be remembered that, when the revival in the demand for iron and steel began to make itself felt in 1898, some exceedingly sanguine members of the trade quite confidently predicted that the country was destined to see at least five years of prosperous conditions. Their roseate view of the future was received with considerable skepticism. The trade had grown accustomed, by quite a train of peculiar experiences, to believe that no betterment in demand and prices could possibly be of a protracted character. It was assumed that our capacity for production could be so easily expanded whenever necessary that if at any time an excessive demand would spring up the supply would overtake the demand so speedily that the trade would soon relapse into its condition of unsatisfactory returns to those engaged in iron and steel production.

Looking back over the immediate past, it is now plainly seen that the most optimistic views entertained in 1898 have been fully verified. These five years have been an eventful period, inasmuch as it has covered a foreign war, the development of a great export trade in iron and steel and other manufactured products, a boom and its collapse, some serious strikes, the assassination of a President, the failure of crops in some important agricultural sections, and occasional disturbances in the stock market, which, for a time, caused considerable apprehension. It appears now that the foundations for a long term of prosperity were very deeply laid and very broadly built during the severe depression from 1893 to 1897. During that time of privations and struggles for existence the manufacturers of the United States were taught more valuable lessons in economical management and in the introduction and application of cost saving appliances than they had ever before learned. The establishments which were able to pass through that trying period and find themselves at its close in perfectly solvent condition, with well equipped plants, and perhaps with command of supplies of raw materials, were in a position to take instant advantage of improved times and to greatly increase their strategic position. The opportunity was also grasped for the formation of large organizations, projected by far seeing men who only needed the backing of capital to enable them to make combinations which they realized would have an enormous advantage in conducting manufacturing operations. Out of these circumstances grew the tremendous advance made by the manufacturing interests of this country during the past five years.

During the period thus under review experienced business men have almost invariably been moved to exercise extreme caution whenever an occurrence of an adverse character has happened. They have permitted their experience under previous conditions to lead them to believe that every check to business activity marked the beginning of a protracted downward course of prices. On no less than three occasions in the past three years have wise men of the iron trade been thus deceived. To the surprise of the majority, the year just ended has passed out under conditions marking the greatest activity yet known. It had been expected that by this time the iron trade would surely be on its downward course. The great falling off in iron and steel exports during the year was one of the influences which it was felt would lead to overproduction if the iron trade should again be obliged to depend solely on domestic markets. The growth of domestic consumption to such a point as to require not only every pound of pig iron and steel produced in this country, but also some foreign material, is a most surprising development. It is one of the marvels of the times. All the increase in capacity during the year has not been sufficient to cause any disturbance in the markets except in the wire trade alone, and in this trade the volume of business has been so large that no serious results have followed from the increasing competition, the recession in prices having been gradual instead of abrupt. It may be said, therefore, that in every line prosperity and full employment continue to be the rule.

The question uppermost in every mind is, How long will this condition of affairs last? From present appearances it will continue until some financial upheaval again destroys confidence, production overtakes consumption, or farming interests suffer from some greater calamity than that of last year.

There is a feeling in financial circles that a very large volume of new issues has been placed on a market whose power of absorption, wonderful as it is, has been greatly taxed. While a good deal of capital has merely shifted, an enormous amount has been put into undertakings which cannot very well be immediately productive. Speculation has suffered some defeats, notably through the pricking of the copper bubble, and there has been some uneasiness in other lines, but on the whole the situation is regarded as essentially very sound.

On the question of a possible early oversupply in the iron and steel trades all doubts are now at rest, at least so far as the first half of 1902 is concerned. In fact, the problem of the moment is rather how to satisfy legitimate demands, there being absolutely no speculation. Our annual reviews, printed elsewhere, deal in detail with the amount of work under way to provide for further expansion of product. There is hardly a concern of any importance in the country which is not enlarging and improving, and there has been some very remarkable work in progress in bringing the plants of the great steel corporation to a higher standard of efficiency. A good many more independent concerns, large and small, have been started, so that not only is the capacity enlarging, but it is also greatly improved in character. In other words, we shall be able to make in 1902 more iron and steel, and cheaper iron and steel, that we ever have done.

Prices, while undoubtedly remunerative, are not so high as to check consumption at home, although they are altogether, for the time being, above the world's level of values. Of course the time will come when we must again seek foreign markets, and then we shall have to be content with much lower returns. But we shall then be very much better equipped to secure a large share of the world's markets. The best opinion in the American iron trade is that this test of strength will not come in 1902.

Nor must it be forgotten that every addition of modern plant in the iron and steel industries in this country, every one of the notable reductions in cost now being achieved, means the displacement of capacity now active in foreign countries. A group of great new furnaces in the Central West, a new steel plant on the Lakes, means that some toddling old furnace in the Black Country, some old puddle mill on the Continent, will soon be forced out of the business. There is a tremendous amount of antiquated manufacturing capacity ready to wander to the scrap heap. Our expansion means more now than it did when we were fighting for our home markets alone. It means that business long held abroad by those who are decrepit and superannuated must go to the new plants of the United States. We have an enormous amount of work before us and need not be frightened because we cannot see an outlet for our products at our immediate doors.—*The Iron Age.*

After inspecting statements showing how many millions of dollars the Iowa farmers have "cleaned up" this year, we understand, says the Minneapolis *Journal*, why there are no large cities in Iowa. The farmers can use the ground to better purpose.

An engineering contemporary says that the best way to harden a steel tool for a special purpose is to heat it to a cherry red, drive the point into a cake of lead, and leave it there until it is cold, when it will be found to be hard and tough.

The following cheap way to blue small pieces of steel is recommended by a contemporary: Put core sand in a babbitt ladle; heat hot; put the work in and shake the ladle over the fire until the required color is obtained.

European Heating Boilers.

BY CHARLES F. HAUSS.

IN THREE PARTS. SECOND HALF OF PART THREE.

In Figs. 110 and 111 is shown a hot water heater of novel construction, made in England. This heater is especially built for heating water in large quantities for baths or for domestic supply where the water carries and is liable to deposit on the heating surfaces large amounts of sediment or scale. To be able to easily remove this sediment or scale, the maker provides seven clean out openings, of which one is at the top, one each at the front and back and four around the bottom of the water way, all covered with bolted plates.

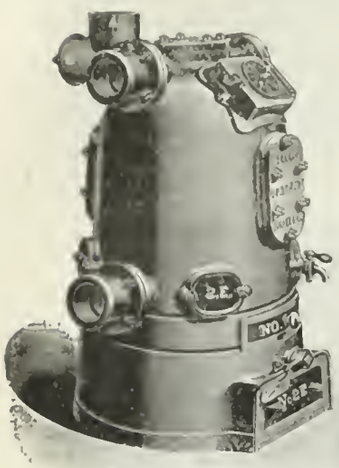


Fig. 110.

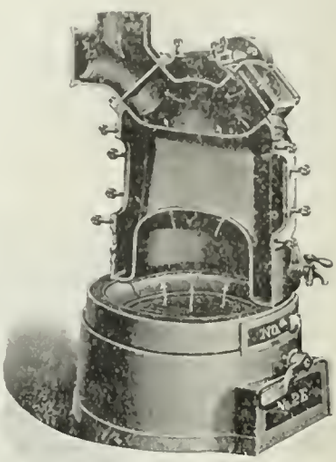


Fig. 111.

Fig. 112 represents a very large sectional boiler made by the same English manufacturer. The peculiar arrangement of the fire surface, and the introduction of air back of the bridge wall to aid in the proper burning of the gases, are the special features claimed for it. The sections are joined together by four long bolts, running through the water ways. The joints are faced, so no nipples or packing are needed. The dotted lines at the back show the rear clean out doors opened, and the deflecting plate thrown back to allow the cleaning of the back fire surfaces.

Fig. 113 shows what is known as a water ring grate, made of hollow cast iron rings bolted together, through which the return water circulates. It is used in connection with wrought iron tubular steam boilers, as in Fig. 114. This same style of ring grate, with some added fire surface at the back, is shown in Figs. 115, 116 and 117 with a large oval magazine feeder for hot water heating.

Figs. 118 and 119 show a similar vertical water grate, made of wrought iron tubes expanded into cast iron top and bottom headers, and connected with a steam boiler. This arrangement gives a large fuel reservoir, and will allow a very high rate of combustion.

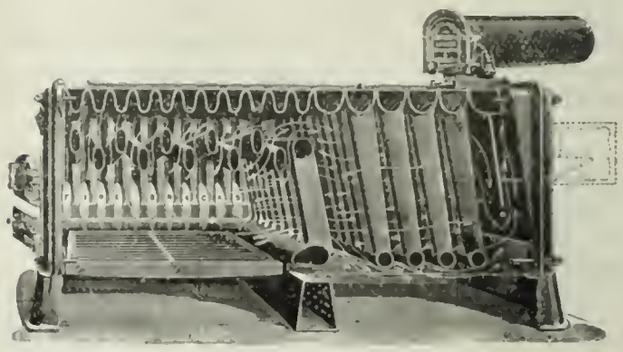


Fig. 112.



Fig. 113.

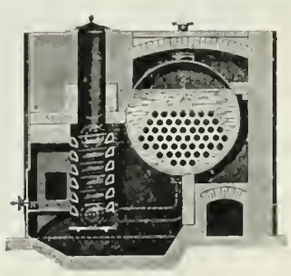


Fig. 114.

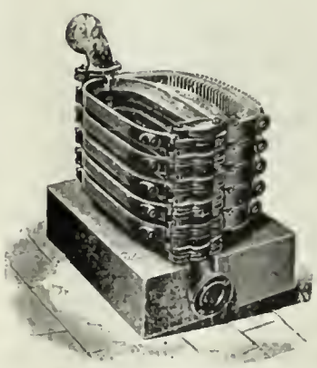


Fig. 115.

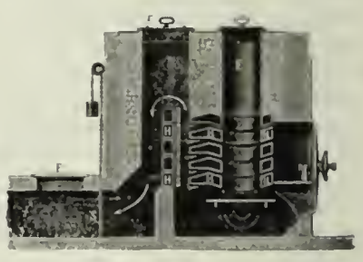


Fig. 116.



Fig. 117.

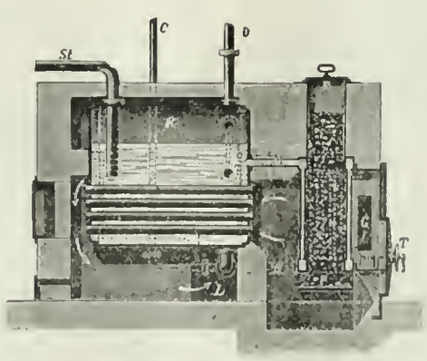


Fig. 118.

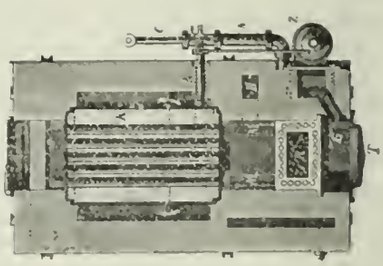


Fig. 119.

EUROPEAN HEATING BOILERS.

The cast iron ring grate, shown in Fig. 113, has five sections with 2.8 square feet of fire surface each, or 14 square feet in all. It is 25 inches high, and will hold about 2 bushels of coke. The one given in Fig. 115 is also 25 inches high, but has 10 square feet of surface per section, or 50 square feet in the complete grate, as shown, which is the smallest size.

Another style of German sectional boiler, with a water grate, and a very large fuel chamber is shown in Figs. 120 and 121. In a test made with a hot water boiler of this type that had 65 square feet of fire surface, 2750 pounds of water per hour was taken from the city water service, entered the boiler at 50 degrees F., and was raised in temperature to 185 degrees F., meaning, in

round numbers, that each square foot of surface took up about 5700 B. T. U. of heat, or 371,000 heat units for the whole boiler, which had a catalogue rating of 260,000 heat units per hour, based on an absorption of 4000 B. T. U. per square foot. The average temperature of the escaping gases in the smoke flue was 225 degrees F., and it was estimated that 10,000 B. T. U. of heat per pound of coke burned, were effective.

For high pressure hot water heating or what is known as the "Perkin's System," the boilers used are made only of heavy wrought iron pipe coils, bent in many different ways, and inclosed in brick walls. Fig. 122 presents a fact that every part of the system must be perfectly balanced. The coils can be divided into as many parts as are wanted, so that each part of the building has its own boiler.

In Fig. 126 is shown a flat wall coil, with the method of connecting, the three way cock, allowing the water to circulate through the coil, or to short circuit into the return as indicated by the arrows. Hence the circulation is never stopped at any time.

The expansion pipes for a closed system are represented in Fig. 127. The pipes *a*, *a*, must be of proper dimensions for the system, both in length and diameter, and must be filled with water up to the level of the top of pipe end *b*, the caps on the ends *b* and *c* being removed during the process of filling the apparatus. For larger systems, several of these expansion pipes must be coupled together.

Fig. 128 shows an expansion tank with a combination

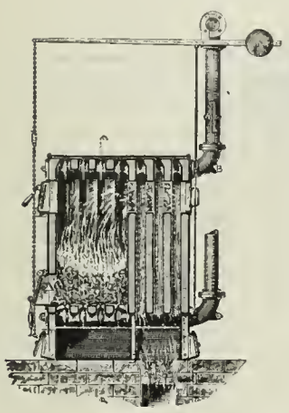


Fig. 120.



Fig. 121.

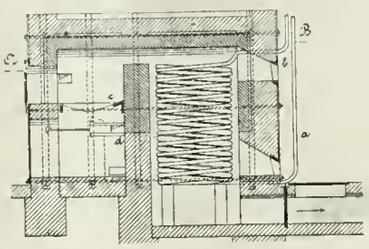


Fig. 122.

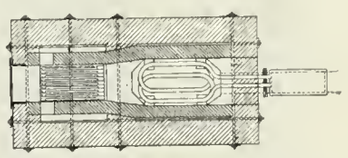


Fig. 122*a*.

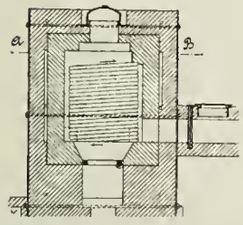


Fig. 123.

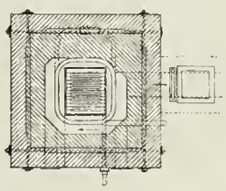


Fig. 123*a*.

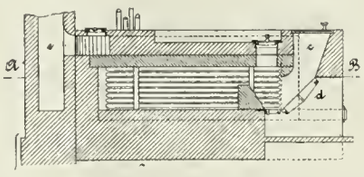


Fig. 124.

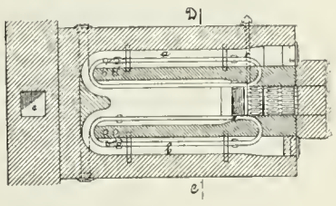


Fig. 124*a*.

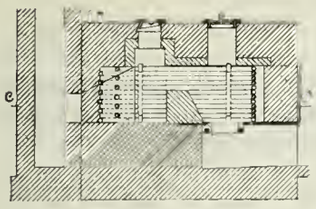


Fig. 125.

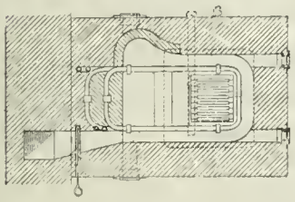


Fig. 125*a*.

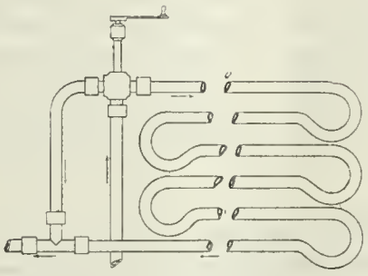


Fig. 126.

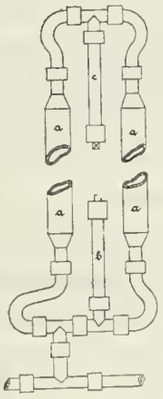


Fig. 127.

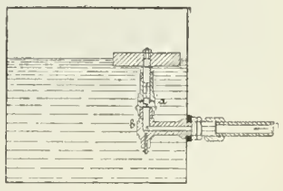


Fig. 128.

EUROPEAN HEATING BOILERS.

boiler of this type with a double coil, and a furnace built in front of it, from which the fire passes over the bridge wall and then down through the coils. The slide damper, *d*, shown just under the grate, when opened, allows air to pass into the air space around the fire pot and enter the combustion chamber on either side of the feed door.

Fig. 123 is a smaller single coil boiler with a magazine feed.

Figs. 124 and 125 are double coil boilers with magazine, in the first of which the coils are together, while in the other they are separate and provide for a longer travel of the gases.

In any of these boilers, the exact amount of fire surface wanted can be exposed to the heat of the flames, an arrangement that is absolutely necessary in view of the safety and vacuum valve for middle pressure hot water heating, which allows the water in the system to escape into the tank when the pressure is excessive, and to return through the vacuum valve as the pressure goes down.

High pressure hot water heating is extensively used in Belgium, but not so much in other European countries.

The writer has not shown any of the boilers herein illustrated and described because he believed in any one of them or considered them models for American engineers, but to convey to the American the European idea of boilers and boiler construction. As each one is the result of the best thought of some ambitious designer, these descriptions will, it is hoped, be at least of interest, if not of service, to the profession in America.

(THE END.)

Keeping Track of Contracts and Jobs.

The system of keeping track of contract work and jobs herewith described is in use by Rossman & Bracken Company, plumbing and steam fitting contractors, 132 East Forty-second street, New York City. Besides the usual day book and ledger, there are used in this system estimating sheets, estimating book, contract record book and contract cost book, all of which are of plain ruled paper, without printed forms. The firm also use printed forms of time sheets, time record book, slips for orders for material on the shop, order slips for material on material houses and charge tickets.

FILL THIS TIME SHEET UP DAILY, AND NOT AT THE END OF THE WEEK.

ROSSMAN & BRACKEN CO., 132 East Forty-second Street, New York.

Time Sheet of James A. Ryan and A. Sunbergen Helper for week ending, Oct 4 1901

Approved by

WRITE DOWN MINUTELY THE DESCRIPTION OF WORK DONE EACH DAY, WHAT FLOOR OF BUILDING, AND WHAT PIECE OF WORK ENGAGED ON

	WHERE	STATE EXPLICITLY ON WHAT FLOOR AND ON WHAT FIXTURE YOU WERE ENGAGED	Contract or Extra Work	When Completed	Workman's Time in Hours	Helper's Time in Hours	Over time Workman	Over time Helper	EXPENSES
SATURDAY	26 St 5 ave	Testing brass lines			4	4½			
MONDAY	"	"			8	8½			
TUESDAY	"	Testing soil lines			8	8½			
WEDNESDAY	"	Connecting soil lines in cellar and running leader out to street			8	8½			
THURSDAY	"	Roughing traps for urinals			8	8½			
FRIDAY	"	"			8	8½			

48 hours constitutes a week's work for workmen, and 51 hours for helpers, which ends Friday night. This slip must reach the shop Friday evening, fully made up, otherwise no wages will be paid.

Keeping Track of Contracts and Jobs.—Fig. 1.—Time Sheet, Actual Size 9 x 12 Inches.

ESTIMATING SHEETS AND BOOK.

When a contract job is to be figured on the work is done on estimating sheets. The estimate includes all material and labor required on the job, figured in detail. The sheets are then filed and if the job is secured the memorandum is copied complete on the estimating book. This book is chiefly useful to refer to if, for instance, the party should claim that all work that was figured on has not been done. If subsequent changes are made in plans or specifications it is learned from this book whether more or less material and labor are required than on the original contract, and whether an addition or reduction is to be made in the original contract price.

CONTRACT RECORD BOOK.

After copying the items of a secured contract on the estimating book the contract price is entered on the contract record book, which is used mainly as a book of record. It is not unusual for large contracts to extend over a period of six months or a year. Sometimes extra orders are received on the same job or deductions are made on the contract. The resulting additions or deductions in price are charged or credited on this book as they may be made.

Time for Week ending Nov 15 1901

NAMES	S	M	T	W	T	F	S	Total Time	Rate p. day	Total Amount	Amount Due	Amount Paid	
Arch Building													
Ryan	X	½						1½			4 20		Ok
Ray	X	½						1½			1 25		
Reilly 11 hrs 5 ave													
Broadley	1½		½	½		½		3			6 00		Ok
Hauer	X	X	X	X	X	1½		5½			5 25		

Fig. 2.—Time Roll Book.

CONTRACT COST BOOK.

Information relating to the material and labor put into a job is obtained from the contract cost book. An estimate is made of the probable amount of space that will be required in this book for a contract job, as, for instance, 10 or 15 pages. Should orders be received to discontinue the job at any time, or if the company are desirous of knowing how much money they have put into the job, which may happen at the end of a fiscal year, the desired information is easily arrived at by entering the cost of material and labor put into the job up to date in this book.

TIME SHEETS.

Every Friday morning, when the sheets of the previous six days are turned into the office by the workmen, each one is given a time sheet like the one reproduced in reduced size in Fig. 1. The size of the sheet is about 9 x 12 inches and is of paper made of manila stock. As the workmen are paid on Saturday this arrangement gives the bookkeeper a day in which to make up the pay roll book. It will be seen that on the top of the time sheet explicit instructions are given regarding the filling out of the sheet by each workman, while at the bottom of the sheet the number of hours constituting a week's work is defined. Helpers are expected to be on the job half an hour earlier than the workmen, to have tools ready and the fire lighted, if one is to be used. The workmen report on the job each day, although not at the shop, and they are expected to put in full time. If it is subsequently desired to know what work was being done at any time and who did it the time sheets tell the story.

TIME ROLL BOOK.

After the time of the workmen is transferred on Saturday from the various time sheets to the time roll book, a portion of a page of which is shown, reduced, in Fig. 2, the amounts are footed up, and this amount shows the total cost of labor for the week, which sum is drawn from the bank for paying the workmen.

ORDER SLIPS.

When the foreman on a contract job needs material he fills out an order on the shop, as shown in part in Fig. 3, reduced. The size of this slip is 8½ x 11 inches. It is of orange colored paper.

ROSSMAN & BRACKEN CO.,
132 EAST 42D STREET.

NOTICE.—Goods will be furnished only on a written Order, marked Extra or Contract and Signed.

Who for Schofield - Juneau

Contract ..... Extra .....

Ordered by R D H Date 10/25/1901

NO	MATERIAL	ORDER	REMARKS
12	2 x 1¼ tees	Ship Rush - by	
1	Oc 3" pipe 2'-0" long	Erie Fyt.	
1	3 x 2 x 1½ tee	G. Richard	
18	2" Ells	Schofield	
6	2 x 45° Ells	Jurlapark	
6	2" drips - closet 4"		
1	2 x ¾ Tee		

Fig. 3.—Order Slip, Actual Size 8½ x 11 Inches.

ORDERS ON MATERIAL HOUSES.

Comparatively little stock is carried in the shop, and the buying of material required on jobs is done day by day by the use of orders on material houses, as shown, reduced, in Fig. 4. These order slips are printed on white paper, 4 x 8 inches in size. They are bound in hook form, two to a page, and perforated, so as to be easily torn out. When an order is made out by the bookkeeper for material as called for by the foreman's order a carbon copy is taken of each order, and when the invoices for the material are received they are checked up with the carbon copy of the order.

ROSSMAN & BRACKEN CO.
Contractors for Plumbing.
132 EAST 42d STREET.

New York Nov 30 1901

№ 2400 Mr. J. L. Mott Iron Works

Please deliver to Bearer 195-6th Jones St

100 Prompt. 10 C. P. 1993

ROSSMAN & BRACKEN CO.

Fig. 4.—Order on Material Houses, Actual Size 4 x 8 Inches.

CHARGE TICKETS.

For workmen doing jobbing work in the immediate vicinity of the shop a charge ticket is provided, as shown

Charge Ticket.

NEW YORK, Nov 25 1901

CHARGE John H. Smith
479 - Thirdlow

2 # Solder
100 # Lead
2 days Plumber + Helper

Repairing Water main

NAME OF WORKMAN, Thos O'Brien
John Jacobs

Fig. 5.—Charge Ticket, Actual Size 5½ x 8¼ Inches.

In Fig. 5, reduced. These tickets are of white paper, 5½ x 8¼ inches in size. The material used on each job is charged on the ticket by the bookkeeper when it is taken from the shop. The workman puts down the time when the job is finished, signing his name and the name of his helper. The time and job are also entered by the workman on his time sheet. The charge tickets are allowed to accumulate until the end of the month, as a 30-day business is done. During the month there may be two or more charge tickets for the same party.

At the end of the month the different accounts, as represented by the charge tickets, are assembled. Items of the same kind of material in each account are grouped and the number of hours are added, and both are charged in the day book, to be posted in the ledger. This entails less work and is a more simple method than to enter the various items from the charge tickets into the day book each day. The tickets are filed for reference in case of dispute in settling the monthly accounts. By this system the ledger is kept posted to date, while the contract cost book can be kept up by the bookkeeper at his leisure.

THE ATTITUDE OF THE NATIONAL ASSOCIATION OF MASTER PLUMBERS.

In *The Metal Worker* of October 26 we presented the correspondence between the National Association of Master Plumbers and the National Committee of the Confederated Supply Associations which led up to the abrogation of the New York Conference Resolutions by the Executive Committee of the National Association of Master Plumbers, at a meeting at Cleveland, and the adoption at that meeting of what are known as the Cleveland Resolutions. A special meeting of the National Committee of the Confederated Supply Associations, held in Chicago, to consider the action of the Plumbers' Association, resulted in the adoption of the Chicago Resolutions, which were printed in *The Metal Worker* of November 16, together with the letter which was sent with a copy of the Chicago Resolutions, to President E. D. Hornbrook of the National Association of Master Plumbers.

In response to the invitation to use the columns of *The Metal Worker* to express the views of his association President Hornbrook has sent us the following communication:

PRESIDENT'S OFFICE,
KANSAS CITY, MO., December 28, 1901.

To the Editor: On November 18 you called my attention to an article in *The Metal Worker* in which reference was made to a meeting of the National Committee of the Confederated Supply Associations, held in Chicago on November 12, and asked for an expression from me on the subject, which you stated you would be pleased to place before the trade.

Secretary Woodward, in his published letter of November 13, addressed to me, stated that they desired to repudiate all statements and insinuations intended to convey the impression that they were to blame for the severance of the New York Conference Resolutions, and also that the responsibility for the failure to enforce the resolutions in the Clow case rested as fully upon the Executive Committee of the Master Plumbers' Association as upon the dealers. I asked Mr. Woodward to prove his statements or make a retraction, and as he has not seen fit to do either I am obliged to defend the action of the Executive Committee of our association.

A careful perusal of my letter of November 26, addressed to Secretary Woodward, will explain our position.

We have no fault to find with the manufacturers and jobbers as a whole, and our relations with them are, I hope, as friendly as ever; but our relations with the National Committee of the Confederated Supply Associations were severed because that committee did not and would not act on cases referred to them, not even in cases where the National Joint Standing Committee on Conciliation had found the charges of violations true.

For your further information I inclose you a copy of a four-page circular letter to the manufacturers and jobbers dated October 17. In case you publish any of the correspondence I think that my letter of November 26 to Secretary Woodward will cover the points.

E. D. HORNBROOK, President.

THE POSITION OF THE NATIONAL ASSOCIATION.

All of the correspondence alluded to in this letter has been printed in *The Metal Worker*, with the exception of the letter of November 26, which is as follows:

OFFICE OF THE
NATIONAL ASSOCIATION OF MASTER PLUMBERS,
KANSAS CITY, MO., November 26, 1901.

C. W. Woodward, Secretary National Committee of the Confederated Supply Associations, New York City:

Dear Sir: Yours of November 13 received. It is a waste of time to discuss matters with one who ignores facts and points at issue, and I dislike very much to continue the controversy, but am compelled to defend myself against your charge of having misrepresented matters. I would not believe it, if it did not come to me officially, that you would attempt to deny facts that you know I can prove by your own letters. If your committee did not know these facts it was your duty to advise them.

I challenge you to produce any evidence as to the falsity of any statements in my letters to you of September 20 and October 14, 1901, or in any other letters or statements pertaining to the enforcement or repeal of the New York Conference Resolutions. On the contrary, I can prove by original papers that the National Committee of the Confederated Supply Associations have, through their secretary, declined to carry out the New York Conference Resolutions in cases of violations referred to them, where the facts were admitted as violations; and I repeat that such failure on the part of the National Committee was the only reason that the plumbers abrogated the New York Conference Resolutions.

You state that the failure to enforce the New York Conference Resolutions in the Clow case rests as fully upon the Executive Committee of the Master Plumbers' Association as upon you. I emphatically deny that the master plumbers are in any way to blame. W. E. Clow, representing James B. Clow & Sons, distinctly notified your National Committee at the time of the joint meeting in New York City, just before the adoption of the New York Conference Resolutions, that they would not be bound by any joint resolutions that might be adopted unless the resolutions suited them. They have not observed the resolutions that were adopted. Your members preferred charges against them for violations. The Joint Standing Committee on Conciliation, on which three of your most representative members (Messrs. Wolff Nelson and Hooper) served, considered the charges made by the jobbers and the plumbers against James B. Clow & Sons, and unanimously recommended a certain course of action in accordance with the New York Conference Resolutions, and your National Committee did not carry it out, though we waited (when the case had been pending since January, 1901,) from July 25 to September 20, for you to act, or give us some assurance that your National Committee would carry out the decision of the Joint Standing Committee on Conciliation.

There is another complaint of longer standing, where your National Committee did not carry out the New York Conference Resolutions. There is a third complaint pending since February 12, where your member had for months continued to disregard the instructions you stated you gave him to observe the New York Conference Resolutions, and no action was taken by your National Committee after your member had admitted the facts and did not agree to discontinue such sales. There is a fourth complaint, where you declined to carry out the instructions of Chairman Torrance.

Before we repealed the New York Conference Resolutions, seven complaints, with sworn statements to prove some of the cases, were referred to you, and some of them have not even been acknowledged.

Regarding the charge of the master plumbers being hasty: Before severing our relations under the New York Conference Resolutions I urged you to give me by a certain date a positive answer as to what you proposed to do on four pending cases, and I received no satisfaction; and having waited 18 days, after giving you notice that we must be advised positively what your National Committee proposed to do, our National Committee abrogated the New York Conference Resolutions. Under all the circumstances it is ridiculous to charge us with being hasty.

I am a sincere believer in arbitration. I was an earnest advocate of the New York Conference Resolutions, and as a delegate to the Baltimore convention worked for their adoption. For over a year I did all I could to make the New York Conference Resolutions a success. At the Kansas City convention, notwithstanding there was an evident disposition on the part of some of your members to evade and disregard the New York Conference Resolutions, I, with others who believed in the principles of arbitration, urged that the New York Conference Resolutions be reaffirmed and continued provided they were enforced by your National Committee. After your many delays and your refusal to carry out the New York Conference Resolutions and the instructions of Chairman Torrance, which I can prove by letters from yourself and Mr. Torrance, I was forced to the unpleasant conclusion that the New York Conference Resolutions, which might have been a success, were a failure owing to their not being enforced, and no proper steps being taken by your National Committee to attempt to enforce them.

I demand that you prove that the foregoing facts are not true, or retract your statements—namely: 1, That the responsibility for the failure to enforce the New York Conference Resolutions in the Clow case rests as fully upon the Executive Committee of the Master Plumbers' Association as upon your National Committee, and 2, that the cause of the severance of the New York Conference Resolutions was not, as I have stated, owing to the failure of your National Committee to carry them out.

I will wait ten days from the date of this letter for you to make a proper correction in the trade press and to your members of your statements in your published letter of November 13, 1901, and if I do not hear from you that it has been done, or will be done immediately, I will take the matter up and enter a positive denial myself, and call for a committee of loyal manufacturers to investigate the facts.

E. D. Hornbrook, President.

Foreign Trade in Boilers and Radiators.

From various sources of information an estimate has been made that about 1500 steam and hot water heating boilers have been shipped from the United States to Europe during 1901, and that 90 per cent. of the total were shipped by four manufacturing houses. The amount of radiation sent abroad last year based on similar reports is calculated at several million square feet. It is stated that one Canadian concern export annually about 1,000,000 square feet of radiation.

The same authority that presents these statistics points out that Europeans are adepts in copying, and that a phenomenal increase has taken place abroad in the number and size of the factories making the goods referred to. Such plants are now being erected in several of the European countries. This would seem to indicate that the time is not far distant when foreign plants will be able to offer substantial competition in the field of boilers and radiators.

A newspaper report states that two plumbers working in Paterson, N. J., placed a gasoline furnace on a kitchen range which had a fire in it, with the result that the furnace was wrecked and considerable damage done to the interior of the room, while both of the men were burned seriously. It would seem that the care which the conscientious plumber should exercise in doing his work would have prevented such a gross piece of negligence.

The Libra Automatic Air Valve.

The American Radiator Company, Chicago, have just put a new radiator air valve on the market. It has been their experience that one of the greatest needs of the heating business has been a perfect automatic air valve. The Libra automatic air valve is claimed by them to be a perfect article. They say it is constructed upon correct principles, as it operates solely by the use of the elements in a steam system—viz.: air, heat and water. It has been thoroughly demonstrated, they claim, that the valve is truly automatic, and is so extremely sensitive that every particle of air is allowed to escape from the radiator. This automatic air valve is so constructed that it offers no opportunity for inquisitive or malicious persons to tamper with or destroy the adjustment. Once the valve is screwed into position and a slight amount of condensation permitted to gather in the well, it is said

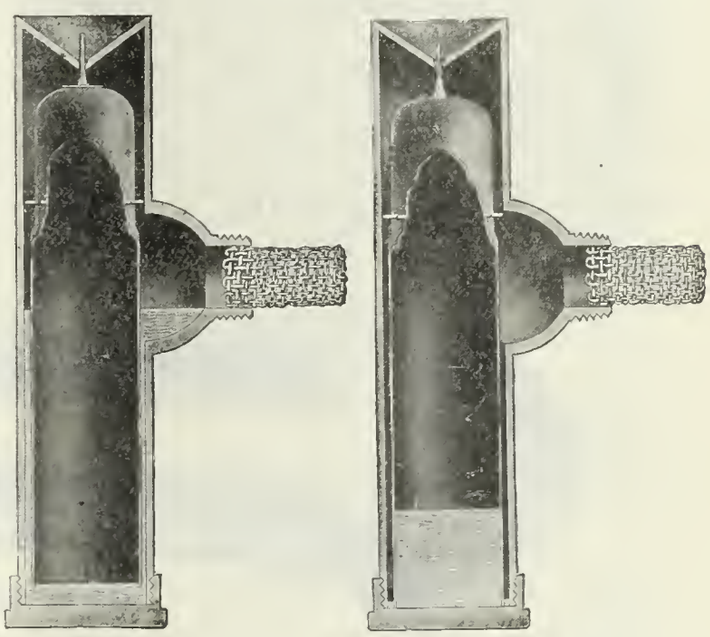


Fig. 1.—Valve Closed. *Fig. 2.—Valve Open.*

The Libra Automatic Air Valve.

to require absolutely no further attention. It is noiseless in operation, and contain nothing which will deteriorate. Its wire screen prevents ingress of grit. The pin or valve seat is of tempered German silver, so that it cannot be cut or injured. It is shapely in form, and hugs the radiator closely. The company further state that it will not cure a bad job of piping or relieve a "water logged" or trapped radiator, but it will do all that is expected of a perfect automatic air valve, and it will wear forever. The valve is shown closed in Fig. 1, and in Fig. 2 it is shown open, the sectional views enabling the operation and construction to be thoroughly understood.

Albany Master Plumbers.

The annual meeting of the Master Plumbers' Association of Albany, N. Y., was held in the De Graaf Building, at Albany, on December 17. After hearing the reports of the officers and attending to the regular business, the following officers were elected for the ensuing year:

President, Frank F. Schimpf.
Vice-President, John J. Britt.
Recording Secretary, Edward Van Loon.
Financial Secretary, Edward D. Scott.
Treasurer, John H. Russell.
Sergeant-at-Arms, T. W. Prior.
Trustees, Herman H. Russ, Richard N. Safford and Allan Gilmour.

D. J. Malene, 88 State street, Binghamton, N. Y., has the contract for the plumbing of the new station for the Delaware, Lackawanna & Western Railroad, at Cortland, N. Y.

New York City Notes.

There is every reason to believe that nearly every plumber in the city is satisfied with the past year's work—that is, if he figured high enough and suffered no losses. The volume of work of all kinds done has been seldom exceeded, and prices in most cases have been good. The builders engaged this year have been of a better financial standing than usual. Hence the losses have not been as great and, in consequence, many are feeling much happier than they did a year ago.

* * *

Contracts still continue to be awarded, and many plumbers will be busy during the winter. Among the late jobs given out are the Pabst Theater and a 12-story apartment hotel at Fifty-eighth street and Eighth avenue. T. Sullivan of 117 East Twenty-third street put in the sewers here, and E. J. McCabe & Co. of 862 Park avenue have just captured the contract for the balance of the work. J. B. Barry of 180 Lenox avenue has just begun work on a large apartment house at Sixth avenue and Fifty-eighth street; James Armstrong of 52 Dey street has the East Side Home on Exterior street, foot of East Seventy-sixth street; Frank Hertel of 1515 Third avenue has a large factory building at Ninety-third street and First avenue; Rossman & Bracken have the plumbing contract for the palatial residence of Senator Clark of Montana at Fifth avenue and Seventy-seventh street; A. W. Reynolds has a large apartment house on Ninety-fourth street, west of Amsterdam avenue, and J. J. Smith is doing the plumbing in the new power houses of the Manhattan Elevated Railroad, at Fifty-third street and Eighth avenue and Spring street, near West Broadway.

* * *

T. J. Andrews, Chief Inspector of Plumbing in the Building Department, has been appointed under the new administration, and the appointment is popular with the association.

* * *

John A. Lee, who was Chief Examiner of Plans under the Chief Inspector of Plumbing in the Building Department, has been appointed Chief Examiner of Plumbing Plans in the new Tenement House Department, under the Building Department. Edwin Carroll, his old associate, has been appointed as his assistant.

* * *

Matthew Haley, B. J. Gorman and James Farrell are among the 16 inspectors of plumbing under the old administration who have been laid off by the new administration.

* * *

James G. Collins of 211 East 116th street, New York, has been appointed Superintendent of Highways of New York by Borough President Cantor. Mr. Collins was formerly one of the "standbys" of the Master Plumbers' Association, and is still a member, although not an active one. He is said by the trade to be well qualified for his work and his appointment is popular.

* * *

Horace Loomis has been appointed Superintendent of Sewers of the Borough of Manhattan, New York. Mr. Loomis has been an *ex officio* member of the Examining Board of Plumbers of New York City from its inception.

Death of Daniel Newman.

Daniel Newman died on Tuesday, December 24, at his home on West Coit street, New London, Conn. He was a native of Ireland, and came to New London in 1850, where he learned the plumbing trade in the shop of Smith & Grace. In 1870 he entered into business for himself in company with J. D. Cronin, under the firm name of Newman & Cronin. Mr. Newman continued in the business until a few months ago, when ill health forced him to retire, and he was succeeded by his eldest son, Daniel T. Newman. He was actively connected with a number of secret societies, in which his interest was exerted for their good. His death was due to cancer, after having twice undergone operations for its removal. He is survived by his wife, four sons and three daughters.

Eagle Pipe Wrench No. 1.

Frank Mossberg Company, Attleboro, Mass., are offering the pipe wrench shown herewith. It is referred to as being made from best quality of steel forgings, hardened, and taking any size of pipe or nut from ⅛ to ¾ inch in diameter. The wrench is 6 inches long, and weighs 8 ounces. It is alluded to as primarily a pipe wrench, but adapted to a multiplicity of needs, including automobile construction and repair. The wrench is described as requiring no adjustment, being always ready for use on any sized object within the limits of its range; as being instantaneous in grip and letting go when desired, and as simple, effective and convenient.



Eagle Pipe Wrench No. 1.

Heating and Plumbing Notes.

James Ross Stewart, a plumber of Braddock, Pa., died on December 20, from pneumonia, at his residence, 501 Washington street, Braddock.

The Master Plumbers' Association of Brooklyn, N. Y., are engaged in an effort to stop the circulation of the advertising matter on Plumbing Goods having the net prices of the articles as a feature. It is claimed that such circulars find their way into the hands of those who have no right to the privilege and the information contained. The circulation of these net price-lists, it is said, has made trouble for the national bodies of both the plumbers and the supply houses.

New plumbing ordinances have been adopted by the City Councils of Atlanta, Ga., and Jacksonville, Fla.

The Canfield Supply Company, Kingston, N. Y., have the contract for placing artistic Steel Ceilings and a hot water heating system, and doing the plumbing and gas fitting in the new store building of Van Duzen Brothers of that town.

O. F. Doyle, St. Cloud, Minn., bid $1200 and secured the contract for heating the new Court House in that place.

Bids will be received at the Department of the Interior, Office of Indian Affairs, Washington, D. C., until January 24, for a steam heating and lighting plant for the Indian school at Fort Totten, N. D.

The establishments of Robert Morrison, dealer in Plumbing Supplies, and Ross & Ayer, Pump dealers, of Peoria, Ill., were visited by a fire on December 14, involving respective losses of $10,000 and $5000.

A FIRE in a one-story brick building at 288 Flatbush avenue, Brooklyn, N. Y., occupied by James Hasley as a plumbing shop, caused a damage of about $500 to the stock and fixtures.

IN a recent issue we mentioned that the resignation of Charles S. Hirschfeld as manager of the Plumbers' Brass Goods department of Landers, Frary & Clark, at 62 Chambers street, New York, had been tendered to take effect on January 1. Mr. Hirschfeld now advises us that he will not, after all, sever his connection with the company, but will continue to act as manager of their Plumbers' Brass Goods department. He adds that it has been decided by the officers of the concern to greatly increase the production of the present lines of Brass Goods and to add a line of new goods as soon as possible. Mr. Hirschfeld will continue the policy that he originally outlined, by marketing these goods through large jobbers all over the country. A new catalogue of Plumbers' Goods is being gotten out by Landers, Frary & Clark, and will be ready for distribution next week.

IT is reported from Pittsburgh that a pool to control the Sewer Pipe trade east of the Mississippi River has been formed by the American Sewer Pipe Company, in which all of the 22 independent manufacturers of Sewer Pipe are included. Arrangements are now being made to establish agencies in New England, New York, Pennsylvania, Ohio and certain districts of the West. A uniform scale of prices will, it is understood, be adopted. The first meeting for the selection of the agencies and to definitely decide upon prices will be held early in the present month. It is said that efforts are now being made to extend the pool to include all the territory west of the Mississippi also.

STANLEY G. FLAGG & Co. of Philadelphia, have purchased 10 acres of ground adjoining their foundry plant at Pottstown, Pa., with the view of enlarging their facilities there.

H. L. ANNESS, who for a number of years has been connected with the International Heater Company, has resigned his position, having gone into partnership with T. B. Cryer of Newark, N. J., to continue the business of T. B. Cryer & Co., heating contractors, in that city.

THE ALGOMA TUBE WORKS, LIMITED, of Canada, just incorporated with an authorized capital of $30,000,000, is the largest company ever organized in Canada. It is one of the F. H. Clergue enterprises. The new company will manufacture Metallic Tubes on the Perrin patent, and their plant will be located at Sault Ste. Marie.

HALF-TONE engravings in the current number of the *Interstate Architect and Builder* show the steel frame and truss work of the new machine shop erected at Detroit by the American Radiator Company of Chicago. A feature of the work was the rapidity with which this building was erected to replace that destroyed by fire on April 5. On April 10 the first contract was awarded for a 123 x 300 foot building and 21 days later, on May 1, the structure was ready for the roof. The erection of the main warehouse, 150 x 444 feet, was carried on simultaneously, and with the new cleaning room and fire proof pattern house the equipment was soon accomplished, giving the company a plant for the manufacture of Radiators of extensive capacity, greatly in excess of their former plant. This speedy erection of so large a plant is truly one of the achievements of the year.

PLUMBING INSPECTOR COOK of South Omaha, Neb., asserts that a great deal of light weight lead piping is being used by plumbers. In some instances pipes that have been dug up are found to have burst on account of being too thin.

E. J. DUNPHY & Co, of Dedham, Mass., have secured the contract for heating the officers' quarters at Fort Banks, Winthrop, Mass., and will use Winchester Heaters.

THE HILDRETH MOTOR & PUMP COMPANY, Lansing, Mich., are purchasing the equipment for the new three-story brick building, 20 x 54 feet, they are to erect. This includes an 18 inch by 8 foot lathe, 20-inch shaper, 20-inch drill press, modern tools and a new or second-hand power elevator. The new company are a reorganization of Hildreth & Co., manufacturers of Iron Pumps and Supplies, and will continue the manufacture of the same line as heretofore, to which will be added the manufacture of Gas and Gasoline Motors from 1 to 12 horsepower.

THE A. VOGLER SHEET METAL MFG. COMPANY, St. Louis, Mo., have incorporated with a capital stock of $15,000 and have opened a factory at 24 South Main street, for the manufacture of Oil and Gasoline Tanks, Bathtubs and all kinds of Cans and Containers. The officers are A. Vogler, president and manager, formerly of the firm of Vogler & Blanke, and H. Goldsmith, secretary and treasurer.

THE WHITLOCK COIL PIPE COMPANY of Hartford, Conn., describe their American Separators and Exhaust Heads in a recent pamphlet.

"AN IMPORTANT ANNOUNCEMENT," is the title of a four-page circular issued by the American Radiator Company of Chicago, asking the criticism and assistance of steam fitters on the plans they have adopted in bringing steam and hot water heating more prominently to the attention of the general public. The circular incloses four advertisements illustrated with half-tone engravings, calculated to attract the eye and with the text so worked as to impress all who read it with the merits of steam and hot water heating. The announcement states that these advertisements appear in 20,000,000 copies every month of the leading family magazines. Those who wish to assist in and profit by the company's campaign of education of the general public, are invited to secure copies of their publications entitled "Home Successful" and "New Business Bringer."

C. C. WILSON of the Charles Graham Chemical Pottery Works, 986 to 1018 Metropolitan avenue, Brooklyn, N. Y., was a visitor at *The Metal Worker* office this week. Mr. Wilson reports an active demand for the high grade Sanitary Earthen Ware, Sinks, Laundry Tubs and Pantry Sinks made by the concern.

THE PRIZER-PAINTER STOVE & HEATER COMPANY of Reading, Pa., are sending to the trade a 32 x 36 inch hanger, bound with metal edges showing their Henderson Steam and Hot Water Heaters. These Heaters are said to be of the "Never Break kind." The vertical sectional Heaters are of the return flue type of push nipple construction. One peculiar feature is an air blast, which brings into contact with the gases rising from the fire, jets of highly heated air which causes the ignition of the gases and the generation of intense heat, increasing the economy and efficiency of the Heater. The Henderson Orbis Heaters are of round form, presenting a large amount of fire surface, and a long fire travel. The construction and operation of these various Heaters may be readily seen by means of broken views and views of partially completed heaters which are presented. The hanger also gives the addresses of the various branch houses of the concern, and it is provided with suitable loops for hanging up in the heating contractor's shop, where it will be valuable for reference.

J. W. CUFF & Co., Philadelphia, Pa., have the contract to install a $8063 heating and ventilating apparatus in the Boys' High School, at Fifteenth and Green streets, in that city. They will also install a steam heating system in the Baptist Church on West Girard avenue.

JAMES T. MURRAY, Hartford, Conn., has the contract for heating the new Tuberculosis Hospital on Cedar Mountain.

THE PROGRESS FURNACE & STOVE COMPANY of Springfield, Ohio, are installing a power and heating plant in the factory of the Krell-French Piano Company, in that city.

WILLIAM J. HIGHLAND, plumber, of 104 Dwight street, Springfield, Mass., is presenting his customers with a neat and attractive calendar.

THE Board of Supervisors of Duchess County, New York, have awarded the contract for plumbing and heating the new Court House, at Poughkeepsie, N. Y., to William Moore at his bid of $21,146. They also awarded the contract for plumbing and heating the County House to Bannon & Co. of Rondout, at their bid of $9492.

THE FRANK J. KNOX COMPANY, Hartford, Conn., deal-

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ers in Plumbers' Supplies, are distributing among the trade a handsome calendar.

WILLIAM E. DONOHUE is moving his plumbing stock and material to his home, at 219 Bloomfield street, Sp[illegible] Mass., where he is erecting a new plumbing shop [illegible]. The store has passed through three fires at his old stand, and hopes to escape other fires in his new location.

OWING to constantly increasing business the Canfield Supply Company, Kingston, N. Y., jobbers of Plumbers' and Tinners' Supplies, have found it necessary to increase their force of salesmen and have secured the services of Leroy Magee as local salesman. Norman MacDonald will represent the concern in their Eastern New York and New England territory.

THE PIERCE STEAM HEATING COMPANY of Buffalo, N. Y., have filed with the County Clerk a report concerning the election of three new directors. These officials are John B. Pierce, Joseph Bond and Elmer Dickinson.

HUEY BROS. of Boston, Mass., are installing four Winchester Heaters in the barracks and officers' quarters at Fort Revere, located at Hull, Mass.

New Firms and Changes.

THE SCHAFFER & BUDENBERG MFG. COMPANY have been incorporated in Brooklyn, N. Y., with a capital of $100,000 to manufacture Steam Fitters' and Plumbers' Supplies.

THE plumbing firm of Bateman & Burt, at Winchendon, Mass., have been dissolved, and the business will be continued by Harry Bateman.

THE EASTMAN MFG. COMPANY of Bridgeport, Conn., have been incorporated with a capital stock of $90,000 to make Plumbing Supplies and Heating Apparatus.

L. A. HOFFMAN & SON have succeeded L. A. Hoffman in the plumbing, heating and tinsmithing business at 254-256 North Broad street, Elizabeth, N. J.

DANA O. MILLER of Chester, Vt., has taken his brother, William, into partnership with him in his plumbing and tinning business.

FREDERICK WEBSTER has opened a gas fitting and plumbing establishment in the Opera House Block, at Beaver, Pa.

TRADE NOTES.

THE OHIO BRASS COMPANY of Mansfield, Ohio, have increased their capital stock to $50,000. E. T. Cooke is president of the company and C. K. King secretary.

THE SCRANTON CORUNDUM & EMERY WHEEL COMPANY of Scranton, Pa., report an increased sale of their products, taxing the new facilities added to their plant during the year. The increased demand is from both domestic and foreign sources. The company's Black Diamond Abrazer has been found especially adapted to the requirements of the Stove manufacturing trade.

THE METALLIC MFG., PLATING & ENAMELING COMPANY of Chicago, Ill., have been incorporated with a capital of $2500. George N. Lyman, Harry B. Signor and George D. Bardon are the incorporators.

THE CHICAGO BRASS COMPANY, Kenosha, Wis., manufacturers of Brass and Copper Sheets, Tubing, Rods, &c., will discontinue their Chicago house, removing that branch to Kenosha.

THE RANDOLPH-CLOWES COMPANY, Waterbury, Conn., manufacturers of Brass and Copper Tubes, &c., advise us that the report that they would move their plant to Buffalo, N. Y., is incorrect.

THE ARCHER IRON WORKS, Chicago, Ill., are sending out a catalogue which will be interesting to Stove dealers and those who operate foundries and machine shops. It contains illustrations of Steel Hand Barrows, Coal and Coke Wagons and various styles of Merchandise Trucks.

U. T. HUNGERFORD BRASS & COPPER COMPANY, 121 Worth street, New York, are notifying their customers by mail that owing to the unsettled condition of the Copper market it is hoped that purchases, until new prices are established, will not exceed actual requirements. They also suggest drawing on their stock in New York for current necessities, thus obviating future loss should a decline occur. By the same opportunity they state their stock of Brass, Copper, &c., in New York warehouse is in excess of 1,000,000 pounds, the leading items of which are mentioned by them.

Ventilate Newly Built Houses.

In discussing the question of sanitary houses a writer in a recent issue of the Journal of the American Medical Association presents some very interesting suggestions:

"Regarding the newly built houses, sanitarians, for the most part, teach that a period of four months in summer and six in winter ought to be allowed between the end of the building operations and the entrance of the inhabitants into a house. In this way will be avoided the accidents that arise from the premature occupation of an apartment.

"It is scarcely necessary to add that, as soon as the house has begun to be occupied, to avoid dampness it should be heated and ventilated; treated, in a word, by all the usual means to maintain a healthy condition of the apartment. If the dampness persists in spite of all these precautions, the proprietor is responsible for the defects in his building.

"Physicians are sometimes requested to estimate the relative dampness of an apartment or room. This is not always easy by simple inspection, as a room may be damp although saltpetre does not grow on its walls or mold in its corners. The following is an exact means of appreciation, and one that is within every one's scope: In the room in question a kilogramme of fresh lime should be placed after hermetically closing doors and windows. In 24 hours it should be weighed, and if the lime has absorbed more than 10 grains of water (that is, more than 1 per cent.), the room should be considered damp and classed as unhealthy.

"The question of dampness of dwellings is a frequent cause of dispute between landlord and tenant, naturally solved in the affirmative by the latter and in the negative by the former. The question can be settled in the future by the test of the hydration of lime, and which will give irrefutable proof or refutation of the validity of such complaint. The dampness of dwellings is a cause of illness. The death rate is greater in quarters where the apartments are damp than where they are dry.

"Ventilation is defective where the walls are impregnated with water; the porosity of the walls is done away with, and can only be re-established after the evaporation of the water has been completed and the heat required to effect this evaporation is furnished by the person living in the room. This is the cause of the vivid impression of cold which we experience in damp places, and it is a well-known fact that exposure to the action of the cold renders the organism more accessible to the attack of morbid germs. The rotting of walls, which appears particularly in places where the water used in building contained nitrates and chlorides, is caused by changes from dryness to dampness and *vice versa*. It gives rise to fragmentation of the mortar, and even of the building stones themselves. Finally frost can split a wall that is soaked in moisture.

"The dampness of dwellings is due to internal or external causes. There can be no doubt that a new building ought to be treated for a length of time by ventilation and heat, with a view to evaporate the really enormous amount of water incorporated with the building materials. According to Pettenkofer, a three-story house requiring 167,000 bricks would need some 825,000 litres of water to build. When this evaporation has been effected great care should be taken in insuring proper drainage for rain and other water."

Secretary Deane of the California Petroleum Miners' Association has published a list of 126 large firms and companies in San Francisco that have adopted oil fuel in place of coal during the past two years. The list contains the names of many of the largest industrial enterprises of San Francisco, including practically all the street railways and great manufacturing plants.

Pattern for Compound Twisted Elbow.

A New York correspondent desires to learn through the columns of *The Metal Worker* how to obtain the patterns for a compound twisted elbow, as shown in Fig. 1. It is very important, our correspondent states, that the elbow have the same dimensions throughout its entire form and that the side curves run perfectly parallel to each other, so that when viewed from either side the curves will be graceful and parallel with each other. Referring to Fig. 1, which is a reproduction of our correspondent's sketch, let A B C D in plan represent the top of the elbow and A^1 B^1 C^1 D^1 the bottom, the elbow making a quarter turn in plan, which reverses the sections of the pipe. D^2 C^2 C^3 B^3 shows the elevation, giving a general view of the twist.

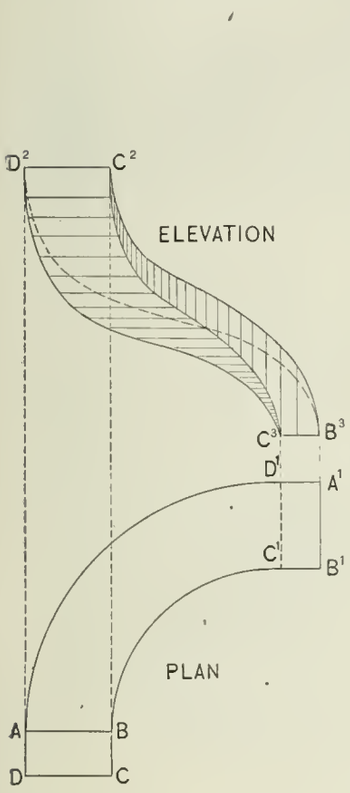


Fig. 1.—Plan and Elevation Submitted by Our Correspondent.

As our correspondent desires that the side curves of the elbow must run perfectly parallel to each other, it will be impossible to first draw the elevation, as the development of the sides must first be obtained and the elevation projected from it. Therefore, in Fig. 2, let A B C D be the plan of the top of the elbow and A^1 B^1 C^1 D^1 the plan of the bottom. Let J represent the center, from which the arcs A D^1 and B C^1 are struck, showing the quarter turn which the elbow is to make in plan.

Before constructing the elevation it will be necessary to lay out the patterns for the inner and outer curve, as follows: Divide the outer curve A D^1 into equal spaces, as shown by the small figures 1 to 4. In similar manner divide the inner curve B C^1 into similar parts, as shown by the figures 1′ to 4′. Draw, as in Fig. 3, any horizontal line, as E F, upon which place the stretchout of the outer curve in plan in Fig. 2, D A 1 2 3 4 D^1 A^1, as shown by D A 1 2 3 4 D^1 A^1 on the line E F of Fig. 3, at right angles to which and from the small figures erect vertical lines, as shown. Assuming that the hight of the elbow is to be as much as indicated by E G, draw the line G H parallel to E F, as shown. As D A and D^1 A^1 on the line E F represent the narrow sides of the section of the elbow, extend the points D and A until they intersect the line G H at D^2 and A^3. From D^2 draw at pleasure a graceful free hand curve to D^1, as shown by D^2 2″ D^1, intersecting the vertical lines previously drawn, as shown by A^2, 1″, 2″, 3″ and 4″. Now set the dividers equal to D^2 A^3 or D^1 A^1 and draw a curve parallel to D^2 2″ D^1, as shown by A^3 3‴ A^1, intersecting the vertical lines at 1‴, 2‴, 3‴, 4‴ and D^3; then will D^2 A^3 3‴ A^1 D^1 2″ D^2 be the pattern for the outside curve of elbow, the lines of which run parallel to each other on the line D A^1 in plan of Fig. 2. As the curves between the points A^3 1‴, D^3 A^1, D^1 4″ and A^2 D^2 of Fig. 3 become rather wide establish an extra point between each, as shown by *a‴*, *e‴*, *b″* and *c″*, respectively. From these points drop vertical lines onto the line E F, as follows: From *c″* drop a line, obtaining the point *c* on

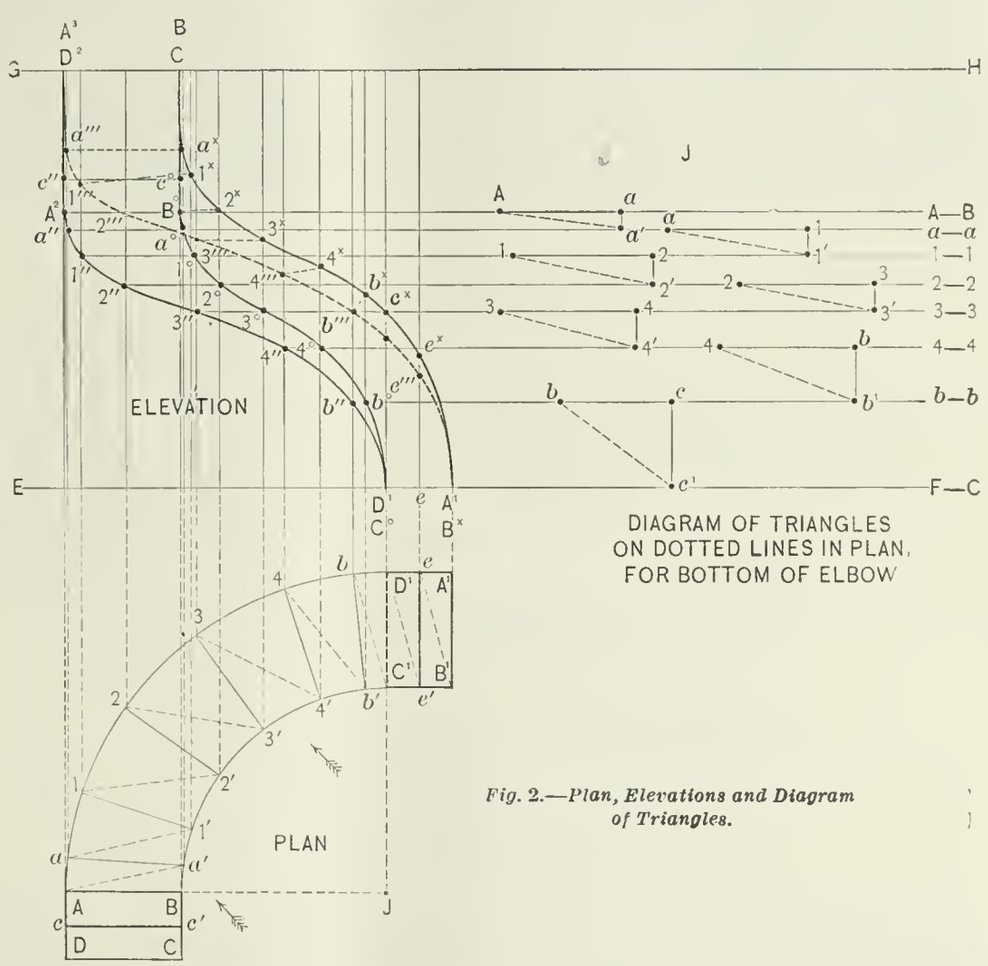


Fig. 2.—Plan, Elevations and Diagram of Triangles.

PATTERN FOR COMPOUND TWISTED ELBOW.

E F. Now take the distance from D to *c* and place it from D to *c* in plan in Fig. 2, and from *c* draw a line parallel to D C, as shown by *c c′*. In the same manner, from *a‴* in Fig. 3 drop a line, intersecting the lower curve at *a″* and the line E F at *a*. Take the distance from A to *a* and place it as shown from A to *a* in plan, Fig. 2. In the same manner in Fig. 3, from point *b″*, draw a vertical line, extending it upward until it intersects the upper curve at *b‴* and the line E F at *b*. From the point *e‴* drop a line, intersecting E F at *e*. Now take the distance from A^1 to *e* and place it in plan, Fig. 2, as shown, from A^1 to *e*. From *e* draw a line parallel to A^1 B^1, as shown by *e e′*. Finally, take the distance from 4 to *b* of Fig. 3 and place it in plan in Fig. 2, as shown, from 4 to *b*.

In Fig. 2 draw any horizontal line, as E F, and take the distance from E to G in Fig. 3 and place it from E to G in Fig. 2. From G draw a line parallel to E F, as shown by G H. At right angles to E F and from all the points on the outer curve D A^1 in plan erect vertical lines, as shown. Measuring in each instance from the line E F of Fig. 3, take the various hights to the points D^2, *c″*, A^2, *a″*, 1″, 2″, 3″, 4″ and *b″* on the lower curve and place them in Fig. 2, measuring in every in-

stance from the line E F on lines drawn from similar numbered points in plan, thus locating in elevation the points D^2, c'', A^2, a'', 1″, 2″, 3″, 4″, b'' and D^1. A line traced through the points thus obtained will represent the miter line in elevation for the bottom line of the outside curve.

To obtain in elevation the top line of the outer curve, take the various distances in Fig. 3 to points A^3, a''', 1‴, 2‴, 3‴, 4‴, b''', D^3, c''' and A^1, measuring in each instance from the line E F, and place them in elevation in Fig. 2, measuring in every instance from the line E F onto lines having similar numbers drawn from the outer curve in plan, thus establishing the points or intersections A^3, a''', 1‴, 2‴, 3‴, 4‴, b''', D^3, c''', A^1, as shown by the dotted line. This would complete the true elevation of the outer curve in plan to correspond to the plan and the development of the outer curve in Fig. 3.

Before obtaining the elevation of the inner curve it will first be necessary to obtain the pattern for the inner curve, for which proceed as follows: Take the stretchout of the inner curve in plan, Fig. 2, as shown by the points C, c', B, 1′, 2′, 3′, 4′, C^1, c', B^1, and place them on the line G H of Fig. 3, as shown by the points C, c', B, 1′, 2′, 3′, 4′, C^1, c' and B^1. At right angles to G H and from these points drop vertical lines, which intersect $a°$, 1°, 2°, 3°, 4°, $b°$, C°. A line traced through the points thus obtained will represent the miter line for the bottom line of the inside curve.

In similar manner, measuring from the line G H in Fig. 3, take the various distances to points B, a^x, 1^x, 2^x, 3^x, 4^x, b^x, C^x, c^x and B^x and place them in elevation, Fig. 2, measuring from the line G H on vertical lines of similar numbers, thus obtaining the intersections B, a^x, 1^x, 2^x, 3^x, 4^x, b^x, C^x, c^x, B^x. A line traced through these points will represent the miter line for the top line of the inside curve of the elbow, and D^2 D^1 A^1 C will represent the elevation of the elbow, shown in plan by D A^1 B^1 C, whose side developments are equal to those shown in Fig. 3.

Referring to the patterns in Fig. 3, it will be noticed that the point A^2 in the pattern for outside curve intersects with the vertical line B in the pattern for inside curve, because the corners in the section in plan, Fig. 2, are lettered A and B. This is mentioned so as not to confuse the reader. As the patterns for the top and bottom will be developed by triangulation, for which diagrams of triangles must be constructed, therefore draw the base lines in plan by connecting similar points, as shown by *a a′*, 1 1′, 2 2′, 3 3′, 4 4′, *b b′* and *c c′*, for solid line triangles, and A *a′*, *a* 1′, 1 2′, 2 3′, 3 4′, 4 *b′*,

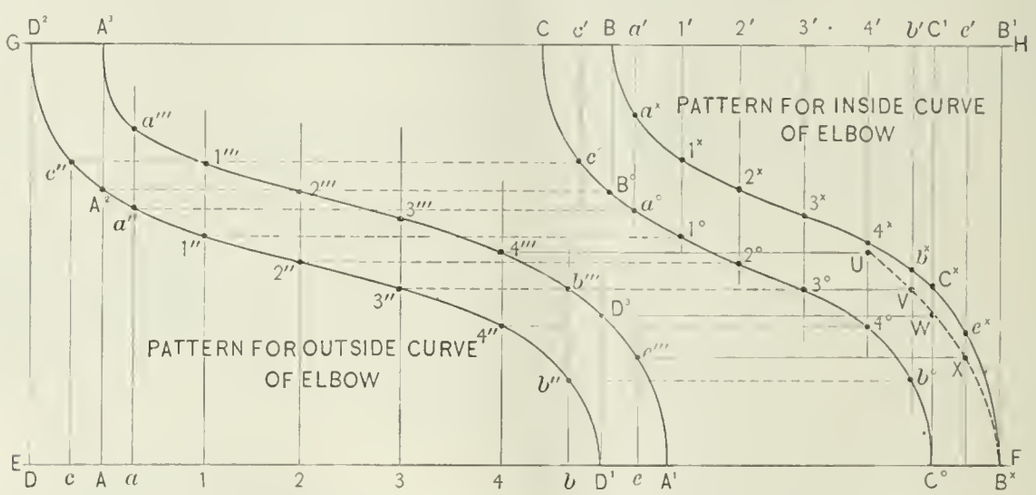


Fig. 3.—Method of Obtaining Patterns for Sides of Elbow.

PATTERN FOR COMPOUND TWISTED ELBOW.

with others drawn parallel to G H from similar numbered points on the lower curve D^2 D^1, thus obtaining the intersections $c°$, B°, 1°, 2°, 3°, 4°, C°. A line traced through these points, as shown, will be the lower cut for the pattern for the inner curve.

As that portion of the elbow shown in plan in Fig. 2 by D A and C B is perfectly straight and has no twist from D^2 to A^2 and from C to B° in elevation, the curve shown in Fig. 3 by C $c°$ B° will be a tracing of D^2 c'' A^2. Now set the dividers equal to C B or C° B^x and draw a curve parallel to C 2° C°, as shown by B 3^x B^x, intersecting similar numbered vertical lines at 1^x, 2^x, 3^x, 4^x, C^x, c^x and B^x. Then will C 2° C° B^x 3^x B be the pattern for the inside curve of the elbow.

As the curves between B and 1^x and 4° and C° are rather wide, introduce extra points, as a^x and $b°$, drawing vertical lines from these points until they intersect the lower and upper curves at $a°$ and b^x and the line G H at *a′* and *b′*, respectively.

Take the distances from B to *a′* and from 4′ to *b′* and place them in plan in Fig. 2 from B to *a′* and from 4′ to *b*, respectively, as shown. Now from all the points contained in the inner curve in the plan erect vertical lines, as shown, into the elevation until they intersect the top line of the elbow G H. Measuring in every instance from the line G H of Fig. 3, take the various hights to points $c°$, B°, $a°$, 1°, 2°, 3°, 4°, $b°$ and C° and place them in elevation, Fig. 2, measuring in each instance from the line G H, on lines drawn from similar numbered points in plan, thus locating the points C, $c°$, B°, *b* C^1, D^1 *e′* and *e* B^1 for dotted line triangles. Thus the sections shown in elevation represent sections on similar numbered lines in plan. For example, 1″ 1° 1^x 1‴ is a section on 1 1′ in plan, as is 4″ 4° 4^x 4‴ a section on 4 4′ in plan, &c. It will be noticed that the bottom lines of the sections in elevation all run in a horizontal plane, while the top are slightly raised on the upper line of the inner curve B 4x B^x. This occurs because the line B 3^x B^x in Fig. 3 is drawn parallel to the curve C 2° C°. If it was desired that the top of the elbow in elevation, Fig. 2, was to show horizontal planes the same as the bottom then in Fig. 3 horizontal lines would have to be carried from points *a‴*, 1‴, 2‴, 3‴, 4‴, &c., on the curve A^3 3‴ A^1 and intersected with the vertical lines *a′*, 1′, 2′, 3′, 4′. &c., in the same manner as the points C″, A^2, *a″*, 1″, 2″, 3″, &c., were intersected with the vertical lines *c′*, B, *a′*, 1′, 2′, 3′, &c., in the pattern for inside curve, and would result in an unequal line, as shown partly by the dotted line *u v w x* B^x in the pattern for the inner curve, which our correspondent wishes to avoid. It is better to have a slight incline toward the top of the elbow, which cannot be seen, than to have an unequal line such as the dotted one *u v w x* B^x would show when viewed from the arrow lines in plan, Fig. 2.

As the solid lines in elevation of bottom of elbow have horizontal planes, then no diagram of triangles will be required on solid lines in plan, the lines there shown in plan being the actual distances. However, diagrams on dotted lines in plan must be obtained, as follows: From the various points in elevation on the

two miter lines representing the bottom of the elbow draw lines to the right of the elevation, as shown by lines A B, *a a*, 1 1, 2 2, 3 3, 4 4, *b b* and F C, which represent the hights in elevation of similar points in plan for the bottom. Now take the lengths of the dotted lines in plan and place them on lines having similar numbers in the diagram of triangles, as follows: For example, take the distance of A *a'* in plan, place it on the line A B in J, as shown by A *a*. At right angles to A *a* draw the line *a a'*, intersecting the line *a a* at *a'*; draw a line from *a'* to A, which is the true distance on A *a'* in plan. In similar manner take the distance of 2 3' in plan and place it on 2 2 in J, as shown by 2 3, at right angles to which and from the point 3 draw the line 3 3', intersecting the line 3 3 at 3'. Then a line drawn from 3' to 2 will be the actual distance on 3' 2 in plan. Proceed in this manner until all of the triangles have been obtained.

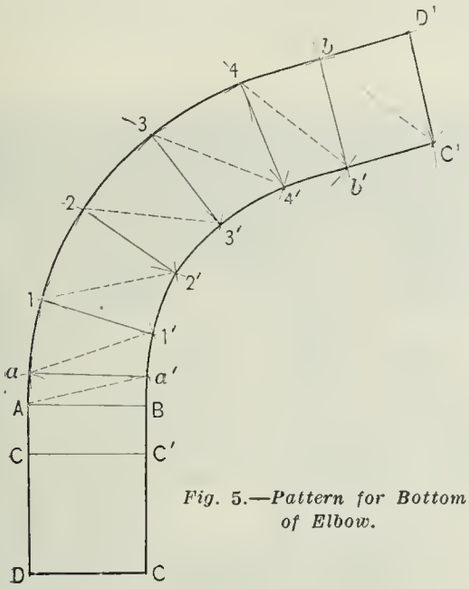


Fig. 5.—Pattern for Bottom of Elbow.

As the top of the elbow shown in elevation does not run on a horizontal plane, diagrams of triangles on dotted and solid lines must be obtained. To avoid a confusion of lines take a tracing of A^3, 3''', A^1, B^x, 3^x, B, which represent the miter lines for the top of the elbow in elevation, and place it with the various points of intersections on same, as shown by similar numbered points in elevation, Fig. 4. From these points draw horizontal lines to the right, as shown by the lines having similar numbers, as A^3 B, a^x *a'''*, 1^x 1''', 2^x 2''', 3^x 3''', 4^x 4''', b^x *b'''*, C^x D^3, e^x *e'''* and A^1 B^x. As the lengths of all the solid lines in plan, Fig. 2, are equal, take the length of A B and place it as shown by A B on the line A^3 B in L of Fig. 4. From the points A and B drop vertical lines, intersecting all the horizontal lines to A^1 B^1 on the line A^1 B^x. Now from the points of intersections on the horizontal lines draw lines connecting lines having similar figures or letters, as *a a'*, 1 1', 2 2', 3 3', 4 4', *b b'*, D^1 C^1 and *e e'*, which represent the actual distances on solid lines having similar letters or figures in plan in Fig. 2.

For the triangles on dotted lines in plan proceed in the same manner as shown in J in elevation. For example, take the distance of 3 4' in plan and place it on the line 3^x 3''', as shown by 3 4, in N in Fig. 4. From 4, at right angles to 3 4, draw the line 4 4', intersecting the line 4^x at 4'. Draw a line from 4' to 3, which represents the true length on the line 4' 3 in plan, Fig. 2. Proceed in similar manner for the balance of the triangles on dotted lines shown in N of Fig. 4.

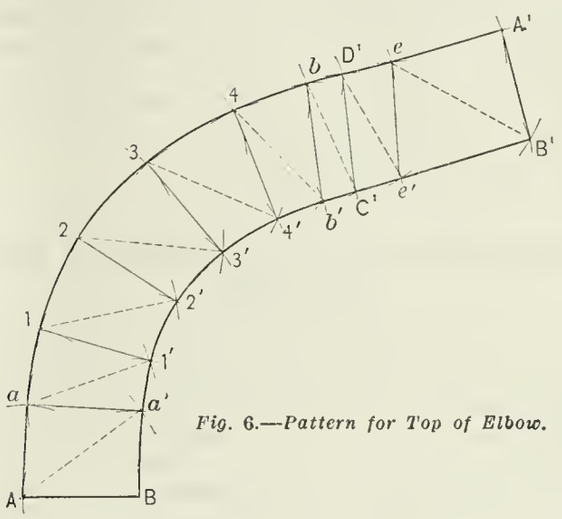


Fig. 6.—Pattern for Top of Elbow.

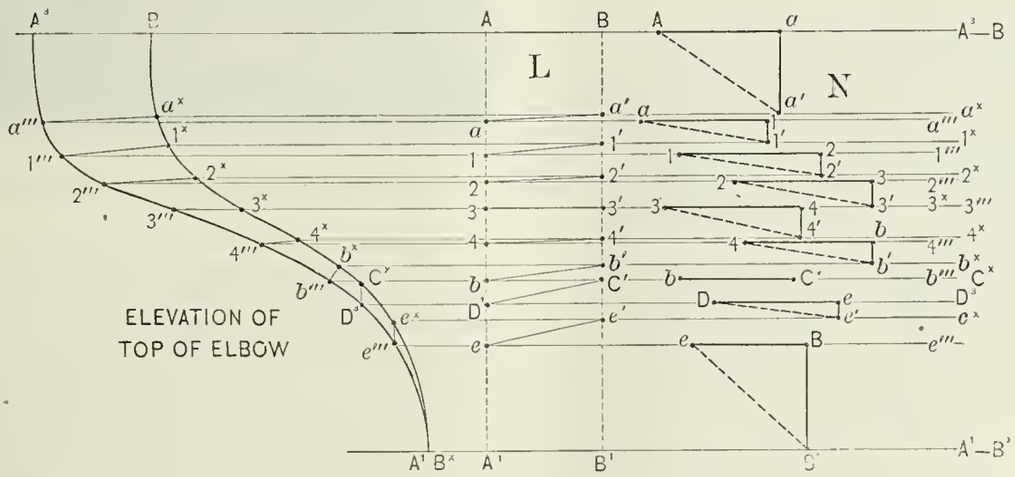


Fig. 4.—Part Elevation, with Diagram of Triangles on Solid and Dotted Lines in Plan, Fig. 2, for Top of Elbow.

PATTERN FOR COMPOUND TWISTED ELBOW.

For the pattern for the bottom of the elbow draw any horizontal line, as D C of Fig. 5, equal to D C in plan, Fig. 2. Now take the stretchout of D^2 *c''* A^2 on the pattern for outside curve, which also equals C *c*° B° in the pattern for inside curve, and place it, as shown in Fig. 5 by D *c* A and C *c'* B, respectively, at right angles to D C. Now, with B as center and B° *a*° of Fig. 3 as radius describe the arc *a'* of Fig. 5. Then, with A as center and A *a'* in J of Fig. 2 as radius, intersect the arc *a'* of Fig. 5. With A as center and A^2 *a''* of Fig. 3 as radius describe the arc *a* of Fig. 5, which intersect with an arc struck from the center A with a radius equal to *a a'* in plan in Fig. 2. Proceed in this manner, using alternately as radii first the spaces on the lower curve in the pattern for inside curve in Fig. 3, then the lengths of the hypotenuses in J of Fig. 2, the lengths of the spaces on the lower curve in the pattern for outside curve in Fig. 3, then the lengths of the solid lines in

plan, Fig. 2, until the last line, D^1 C^1 of Fig. 5, has been obtained. A line traced through these intersections, as shown by D^1 C^1 2′ C D 2 D^1, will be the pattern for the bottom of the elbow.

For the pattern for the top of the elbow draw any horizontal line, as A B in Fig. 6, equal to A B in plan, Fig. 2. Now, with B a^x in the pattern for inside curve as radius in Fig. 3 and B of Fig. 6 as center, describe the arc a'. Then, with A as center and A a' in diagram N of Fig. 4 as radius, intersect the arc a' of Fig. 6. Then, with A^1 a''' in the pattern for outside curve in Fig. 3 as radius and A of Fig. 6 as center, describe the arc a. Now, using a' as center and a a' in diagram L in Fig. 4 as radius, intersect the arc a of Fig. 6, as shown. Proceed in this manner, using alternately as radii first the spaces on the upper curve in the pattern for inside curve of elbow in Fig. 3, then the lengths of the hypotenuses in diagram N of Fig. 4; third, the lengths of the spaces in the upper curve in the pattern for outside curve of elbow in Fig. 3, then, finally, the lengths of the solid lines in diagram L of Fig. 4, until the last line, A^1 B^1 of Fig. 6, is obtained. A line traced through these intersections, as shown by A^1 B^1 3′ B A 3 A^1, will be the pattern for the top of the elbow.

THE METROPOLITAN CORNICE AND ROOFING TRADE.

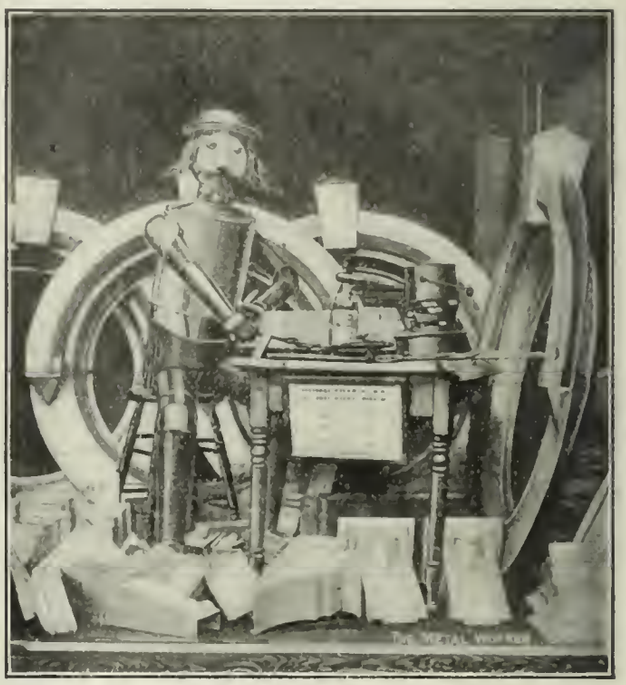
The cornice making industry around New York City has been in a fairly prosperous condition during the year of 1901. While some of the shops report that business has not been as good as it should be and that the competition of the smaller houses has taken away much of the profit, the majority say that business has been good, and that the year 1901 was a prosperous and successful one. It is, however, the general opinion that the percentage of profit on work has been reduced by competition.

At the present time there appears to be a fair volume of work in the shops, and the prospects for the new year seem to be bright, although it is hard to figure very far ahead in this line. An unusually large amount of work has been figured upon, but owing to the high prices of all building materials much of this work has not been started, as builders are waiting for prices to fall. One of the most prominent local contractors stated that over 80 per cent. of the work he had been figuring on had not started, owing to the high prices, and much of it, he thought, would not be begun until prices were lower. He added that regardless of this his shop had been kept full with the work that came along. Another contractor said that during the past three months plans had been filed in the Building Department for a much smaller number of large buildings than usual. He added that the public was not investing in buildings at this time, and that the only large work being done was the construction of public buildings, office buildings on which no expense was spared and other buildings that are absolutely necessary. From the present indications lower prices in building materials would mean a very large amount of work to be done.

During the past year there was but one labor trouble of moment, which is still on. It is not so much a question between employers and workmen as it is between two unions. The members of the employers' association had a contract with the cornice makers' union in reference to work which does not expire until September 1, 1902. The roofers demanded on September 1 last that they should be given some of the work now being done by the cornice makers, such as the putting on of corrugated metal siding. These demands the employers could not grant without breaking their contract with the cornice makers, and they were met with the rather unique proposition of either granting the demand of the roofers and breaking the agreement with the cornice makers, thus causing the latter to strike, or keeping the agreement and having the roofers strike. They chose what they regarded as the lesser evil, and the result is that the roofers have been locked out by the employers, who are putting the cornice makers at the roofers' work. While the work is not being done as rapidly as formerly, the employers are experiencing no trouble in getting all of that class of work done and in a fairly satisfactory manner. While several attempts have been made to bring about a compromise, one has not yet been effected.

THE CORNICE MAKER AT WORK.

The cornice maker at work was the subject of a window display exhibited last Labor Day at the hardware store of G. A. Gridley & Son, Elmira, N. Y. It was designed and erected by William H. Halliday, an employee of the firm, and shows a cornice maker sitting on a stool soldering a galvanized iron cornice bracket, the left hand holding the bracket in position and the right hand a soldering iron. In assembling the man, which was life size, the following articles were used: The



The Cornice Maker at Work.—A Window Display.

crown of the hat was a 3-pint basin, the rim a 7-inch stove pipe collar, the back of the head a jelly dish, the face a quart basin, the eyes were zinc can screws, the nose a coffee pot lip, the hair, mustache and chin whiskers were fine strips of sheet iron, the neck a 1-quart pail, the necktie a 1-inch strip of Russia iron, the body a 20-quart cream pail with cover, the trunk a sheet iron cooker, the shoulders were sugar scoops, the upper arms were of Russia pipe, the elbows 3-inch Russia elbows, the forearms were Russia pipe; the hands, 4-inch flat paint brushes; the thumbs, 1-inch round brushes; the thighs were Russia pipe, tapering 6 to 5 inches; the knees, 5-inch Russia iron elbows; the lower limbs, Russia pipe, tapering 5 to 3 inches, and the feet were composed of horse-radish graters.

On the table were a hammer, snips, a gasoline fire pot, &c. The background was galvanized iron circular windows, miters, dentals, brackets, &c., being scattered around on the floor. Every article used in the construction of the man and the display went back into stock. The bottle seen on the table is a bottle of mineral water and was placed there by some miscreant after the decorator had fled, and is a joke in itself, as who ever heard of a cornice maker taking a drink of mineral water!

We are indebted to George B. Blizard, Tin and Sheet Iron worker and Tin roofer, 108 and 110 Manton street, Philadelphia, for one of the wall calendars which he is sending out this year to his customers. On the upper part of the calendar is displayed a picture in colors of "The Old Mill," the calendar sheets being attached to the lower part, which also bears the name and address of the donor and reference to the lines of work which he is prepared to undertake.

WHAT SHOULD A CORNICE MAKER KNOW?

A correspondent writing from British Columbia in reference to the article in our issue of December 21, on "What Should a Cornice Maker Know," says that the difficulty seems to be in reading blue prints. Any good cornice man, he remarks, can get a thorough knowledge of blue prints by taking a course in the International Correspondence Schools. The writer states that he has taken such a course and knows that it is just what is wanted.

Fire Proof Metal Windows.

The Smith-Warren Company, 143 Federal street, Boston, Mass., have prepared a 40-page catalogue of the Smith patent fire proof hollow sheet metal window frames and sashes, which have been illustrated and described in these columns. These fittings are made in various styles, which are illustrated in the catalogue, both by sectional and front views. Special attention is called to the firm's automatic self closing device whereby the windows are closed automatically by the action of heat. A series of interesting half-tone pictures are given of a fire test recently made in Philadelphia with a brick building containing one of the Smith fire proof windows. The first picture shows the window open with a pile of oil saturated wood in front of it, ready to be ignited. The next displays the window in the act of closing 40 seconds after the match was struck to ignite the wood. The final illustration shows the window as it appeared, absolutely intact, after the fire had been maintained for a half hour on the outside, with the hose turned on to the window; after which the fire was ignited on the inside of the building and maintained for another half hour, and the hose turned on again. The company claim that windows made of their metal frames and sashes and glazed with wire glass are supplanting fire shutters in many places, being found absolutely fire proof, and at the same time affording free access for light. In addition to a general description of the company's metal windows, the book contains instructions for taking measurements, which it is necessary for the company to know in order to construct frames; also some full page illustrations of their work shops and letters from architects, insurance companies and other parties testifying to the efficiency of the company's system.

N. & G. Taylor Company.

N. & G. Taylor Company of Philadelphia, Pa., will move their general offices early in January to the Mariner and Merchants' Building, at the corner of Third and Chestnut streets, where they are having spacious offices fitted up for their use. This change is necessary for their rapid growing business in the enlargement and development of their tin plate plant, for their trade in open hearth soft steel sheets for stamping purposes, and for their business in plate, iron and steel. Their minor offices will be transferred to their tin plate works on Tasker street, in Philadelphia, where they are already making important additions and building a very large warehouse, fully equipped with electrical elevators for the rapid handling of their product. The box department and the black plate department are also being enlarged and another story added to this building. They are also enlarging their smelting works to meet the increased demand for their fine makes of solder, &c. They have occupied the property on Branch street since 1845, and are now giving it up simply to obtain larger and more convenient accommodations.

Since the opening of the day Cornice class at the New York Trade School, Sixty-seventh street and First avenue, New York, two pupils have been admitted to the course, whose names were not given in the list presented in *The Metal Worker* of December 14. The new students are Bernard Reynolds and Gustave Kretschmann, both of Brooklyn, N. Y. The class now consists of ten members, as compared with four members in last year's day class.

Death of James Hicks.

The death of James Hicks of Piqua, Ohio, which took place at the Waldorf-Astoria Hotel, New York, on December 24, caused a shock to his friends. Mr. Hicks had come to New York City to spend the Christmas holidays. A day or two after his arrival, while preparing to seal an envelope, he cut his tongue with the sharp edge of the flap. The injury was so slight that Mr. Hicks paid little or no attention to the matter until alarming symptoms developed, and it was found that he was suffering from blood poisoning as a result of the cut. The disease made rapid progress and he died within a few days of the injury. Mr. Hicks was a well-known steel manufacturer and was closely interested in the Cincinnati Corrugating Company and the Piqua Rolling Mill Company, manufacturers of sheets, both of which concerns were absorbed by the United States Steel Corporation. Mr. Hicks was in the prime of life and his unlooked for death is a matter of great regret to his many friends.

FLASHINGS.

A. A. Upson, one of the oldest retired businessmen of Cincinnati, Ohio, and who for upward of half a century was prominently connected with the Tin Plate and Sheet Iron trade of that city, died at home in College Hill, Ohio, on December 19, at the age of 86 years. Mr. Upson was a man of fine character, and was held in high estimation by all who knew him.

Frank Jarvis has resigned from the New Process Galvanizing Company of Niles, Ohio, to enter the employ of the Youngstown Iron & Steel Roofing Company of Youngstown, Ohio.

It is announced that the big new plant of the Youngstown Iron, Sheet & Tube Company of Youngstown, Ohio, will begin operations next Monday.

William B. Scaife & Sons Company of Pittsburgh, Pa., have been incorporated under New Jersey laws with a capital stock of $850,000, to manufacture Corrugated Sheets, &c. The incorporators are K. K. McLaren, Aug. S. Meeker and C. W. Perkins.

The American Rolling Mill Company have placed an order with Edward E. Erikson of Pittsburgh, Pa., for an additional Bar mill furnace for their plant at Middletown, Ohio.

W. C. Nimmo & Co., Baltimore, Md., dealers in Tin Plates and Metals, and roofers', tinsmiths' and stovemen's supplies, have favored us with one of the neat little vest pocket notebooks which they are sending out to their friends and customers. The notebook contains, in addition to a number of blank pages, several pages devoted to information that will be generally useful to businessmen. It also bears references to the firm's special brands of Terne Plates, including Nimmo Old Style, Sandow Old Style, Yale Old Style, Tuxedo and Rosedale Extra Coated.

H. J. Pratt & Co. of Springfield, Mass., have completed the Metal Cornice work on a new block built, in that city, by H. W. Cooley.

Henry Weyand, Waterbury, Conn., has the contract for the metal work on two new blocks of buildings being erected by Hotchkiss Brothers & Co., at Torrington, Conn.

The plant of the Parkersburg Iron & Steel Company, Parkersburg, W. Va., was put into operation December 18. Bernice Budke of Canonsburg, Pa., daughter of John F. Budke, christened the plant by breaking a bottle of wine over the main fly wheel.

We have received from W. F. Overly, manufacturer of Architectural Sheet Metal Work, Greensburg, Pa., a neat glass paper weight in the shape of a rose, and having the firm's name and address inscribed upon it in gold letters. The friends and customers of Mr. Overly who received this useful Christmas souvenir will no doubt greatly appreciate it.

Stowell Mfg. Company, Jersey City, N. J., manufacturers of fire proof Asphalt Roofing, Asphalt Paint, &c., are largely increasing their facilities, and are getting into

a position where they will be able to make prompt shipment of all orders.

A fire on December 25 did about $1000 damage to the plant of the Chicago General Tin Works, at 141 and 143 Ontario street, Chicago, Ill.

The Chicago Tin Can Company have been incorporated at Chicago, with a capital stock of $20,000, by Moses Giel, Aaron Adelman and Henry Cohen.

The Newport Rolling Mill Company, Newport, Ky., are about completing three new finishing mills and two cold roll mills, which they expect to have in operation about the middle of February, for rolling Steel Sheets of sizes from 10 gauge up, and from 42 inches wide to 120 inches long. They inform us that their mills have been running continuously for the past year, with but two weeks' intermission, and are full up on orders for the first quarter of 1902, they having turned down a large tonnage in the corrugating and roofing departments during the past three months.

The Iowa Can Company, Des Moines, Iowa, manufacturers of tea, coffee and spice Cans, &c., are in the market for presses, &c., for small work. The company were organized early in 1901 and began business in a plant on Third street. Increased business compelled them to seek larger quarters, and they have leased a building, containing about 40,000 square feet of floor space, which they are fitting up for operation.

It is stated by one of the directors of the United States Steel Corporation that production and sales of Tin Plate by the American Tin Plate Company for 1901 will amount to as much as during the year 1900. The strike this year had no more effect on output and sales than did the adjustment of the wage scale which closed the mills in 1900, so it is claimed.

The Youngstown Iron, Sheet & Tube Company will push work as fast as possible on the new blast furnace and open hearth steel plant, which are to be built at Haselton, where the Sheet and Tube mills of this concern are being built. It is probable the blast furnace will have a daily capacity of 500 to 600 tons, while the Steel plant is expected to turn out 600 to 800 tons of steel per day. It will be recalled that this concern recently increased their capital stock from $2,000,000 to $4,000,000. The new stock will be offered first to present stockholders and then to the public.

F. J. Spelbrink, who has represented Berger Bros. Company of Philadelphia in New York State for several years, has severed his connection with that firm, and will represent McClure & Co., Tin Plate manufacturers and dealers in Tinners' and Roofers' Supplies, of 211-215 Second avenue, Pittsburgh, and 115 North Seventh street, Philadelphia, in the same territory. Mr. Spelbrink is well and favorably known to the trade, and his friends will wish him full success in his new connection.

Iwan Bros., Streator, Ill., have opened a branch office for the sale of their specialties in charge of Charles Morrill, 277 Broadway, New York, who will carry a stock from which direct shipments can be made. The firm are manufacturers of Chimney Tops, Conductor Hooks, Pipe Hangers and other Hardware Specialties. They have just issued an illustrated circular giving a full description with illustrations of their Volcano Revolving and Ventilating Chimney Tops, their Sickle Conductor Hooks for brick or wood and their Perfection Conductor Pipe Hanger.

The trade will be interested in noting the ninety-third annual greeting of the old established Tin Plate and Metal house of N. & G. Taylor Company, Philadelphia, contained in another part of this issue.

On January 1 Buchanan-Foster Company, offices 724 Drexel Building, Philadelphia, Pa., succeeded Garrett-Buchanan Company in the Building and Roofing Paper business. The new company have purchased the mill and tar refinery at York Haven, Pa.

A report from Atlanta, Ga., states that deposits of asbestos have been discovered on the property of Lieutenant Wilmer O. Chrisman, near Atlanta, and that they will be developed.

FAREWELL TO 1901.

BY TINSMITH.

Good-by, Old Year,
With memories dear.
Now that you've past,
We wish you'd last,
Indefinitely.

Tho cash we made,
While yet you stayed,
Is quite a pile;
'Twill make us smile
Delightfully.

The outlook, too,
Into the New,
You helped to make—
So let us shake
Felicitously.

We pledge with zest,
To do our best,
To make your son
A great big gun;
Emphatically.

Good-by, Old "1,"
Your record's won.
We'll try, in "2,"
To outdo you.
Substantially.

New Publications.

Linear Drawing and Lettering for Beginners. By J. C. L. Fish, Associate Professor of Civil Engineering in the Leland Stanford, Jr., University. Size, 7 x 10½ inches; 65 pages. Illustrated by four full page sheets and 50 figures. Bound in flexible cloth, with side title. Published by the author. Price, $1, postpaid.

Blank Book for Lettering, to be Used with Linear Drawing and Lettering. By J. C. L. Fish. Size 7 x 10½ inches; oblong in shape; 30 sheets ruled on one side for lettering practice. Bound in paper covers. Published by the author. Price, 25 cents, postpaid.

This work, as the title indicates, is intended for those desirous of acquiring a knowledge of linear drawing and lettering, and is comprised in four chapters. The first of these relates to instruments and materials, the second deals with a course in linear drawing, the third is given up to lettering, while the fourth presents an introduction to drafting. The author states that the work embraced in chapters two and three constitutes a course of 50 working hours in linear drawing and lettering in Stanford University as it has been given during the past eight years, and as preparation for the drafting in the courses in descriptive geometry, elementary machine drawing, surveying and graphic statics.

Marvelous, if true, says *Fire and Water*, will be the universal exclamation on hearing that a resident of Richmond, Ind., claims to have discovered a method, not of extracting sunbeams from cucumbers, but of storing the heat rays of the sun by a process the reverse of that employed for making ice. The inventor states that he has discovered a substance, which is abundant and cheaply produced—(something in the line of coal possibly, whose heat scientists ever is simply bottled up sunshine). It will absorb heat rays and hold them until driven out again. The process by which the heat will be driven out and the composition of the blocks are still secret.

We have received with the compliments of the Bourse of Philadelphia, a calendar for 1902, which is being distributed by the institution as a reminder of the fact that the Bourse offers an excellent meeting place for businessmen, and also that the building contains available office space as well as space for exhibiting goods for sale. The calendar is arranged with a brass ring for hanging, and with blank spaces against each date for notes.

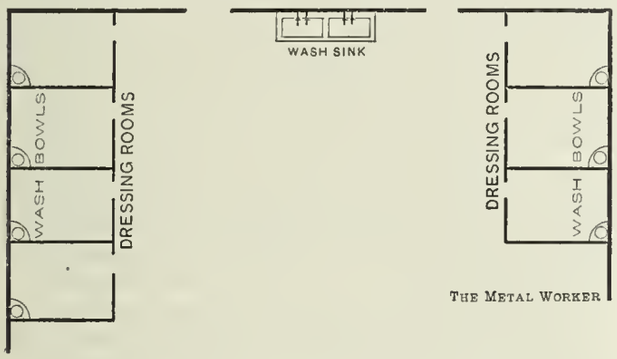
THE LETTER BOX.

Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

WANTS HOT WATER SERVICE SYSTEM.

From E. M. C., Greenwich, Conn.—Will the readers of *The Metal Worker* aid me in concluding which is the best way to connect hot water pipes to the fixtures located as shown in the sketch given herewith? They consist of several wash basins located in the dressing rooms of a small theatre, and a large wash sink having two hot water faucets. I want to know how large a hot water boiler to use. I wish to heat it by means of a water heater or coil placed in a Wheeler furnace having a 34-inch fire pot. This furnace is used to heat the opera house. The furnace will be located about 10 feet below the fixtures.



Wants Hot Water Service System.

QUESTIONS ON FURNACE WORK.

From Modest Yankee, Maine.—I have read with much interest the articles in *The Metal Worker* on furnace work and wish light on a few points. One is, How shall the capacity of a furnace be determined so that an average man can know that what he buys will have power enough and be able to judge of the correctness of the maker's rating?

There is need enough for us all to learn something on this point, for the manufacturers of furnaces will give the cubic feet a furnace will warm and the number of hot air pipes it will take care of, say, three 10-inch and two 9-inch hot air pipes. But when you figure up the two don't compare, and if you put in a furnace on their basis, look for trouble. They will send down a man to figure up a job for you, who will take the glass and wall surface and cubic contents into consideration, and if you are an old timer you will find out that you don't know anything. It seems that it will be but a short time before a boy, to learn the trade, will have to be a college graduate.

Another thing on which I would like to get the experience of furnacemen is the value of cone or flat top furnaces. Here in the East about all houses who do a large business use 45-degree ells and cone tops, whereas I have always got a better job and best results from flat tops. Not having a big head on me, however, I take it for granted the others are right.

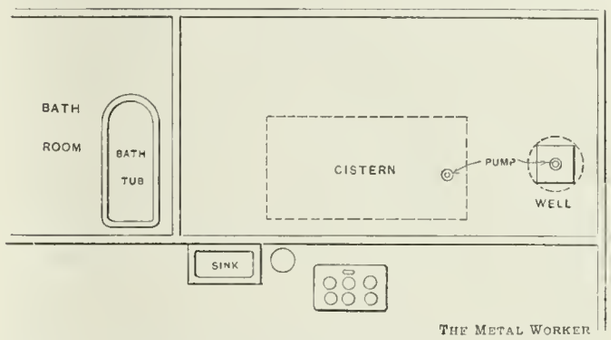
FROST ON WINDOWS.

From J. U. & Son, Louisville, Ky.—I have noticed in recent issues of *The Metal Worker* arguments about keeping frost from windows. The one put forth by "R. C." in the issue of December 7 regarding the way the air circulates in a closed in show window is right. We have used two windows made as he describes and they have never frosted, although we have given the system a five years' trial. At the present time our weather here is 7 degrees below zero, and our windows are just as clear as in summer. Our show windows have holes in the top and bottom, and a feather placed in the window near the glass is carried by the ascending current of air to the top of the window.

TANK FOR KITCHEN BOILER SUPPLY.

From S. A. M., Mentone, Ind.—Will *The Metal Worker* kindly inform me how to arrange a tank for supplying a boiler which is to be connected with a water back in a stove? We have no water works and must use a tank to supply the boiler, and would like to have the tank located in the bathroom. I would be glad to have some idea how to do the work. The sketch (given in Fig. 1) presents the relative location of the kitchen, bathroom, cistern and well from which water can be drawn.

Answer.—From our correspondent's sketch we assume that the bathroom is on the same floor as the kitchen in which the stove is used, which would interfere with giving any considerable pressure to furnish a strong flow of water at the fixtures supplied. However, if a combination lift and force pump is used water can be taken from either the well or the cistern or both, as may be desired, by use of a stop cock on the suction pipe, and by means of stop cocks at the discharge water can be forced to the boiler supply tank, or can be drawn at the pump, as desired. If a pipe of about the same size as the suction pipe is used it will reduce the friction and force required to work the pump. It should be carried to the tank, which should be placed as near the ceiling as possible, and made as large as can be conveniently supported. The bottom of this tank should be at least 2 feet above the top of the boiler. The water should be taken from the bottom of the tank to the boiler, and a small pipe should be run from the tank near the top to the bathtub, so that when the tank is sufficiently full water flowing into the bathtub will give notice of it. A much larger pipe should lead from the tank at the same level out of doors, so that in case of overflow the surplus water can be discharged where it will do no harm. The pipe supplying cold water to the bathtub should be taken out of the side of the tank several inches above the bottom. The pipe which is to bring hot water from the boiler to the bathtub should run up to a hight equal to that of the cold water supply to the bathtub. This will make it impossible for all the water to be drawn from the tank, and to leave the boiler without a water supply. Where the tank is so slightly above the top of the boiler, very little water pressure will be exerted,



Tank for Kitchen Boiler Supply.—Fig. 1.—Plan Showing Location of Fixtures.

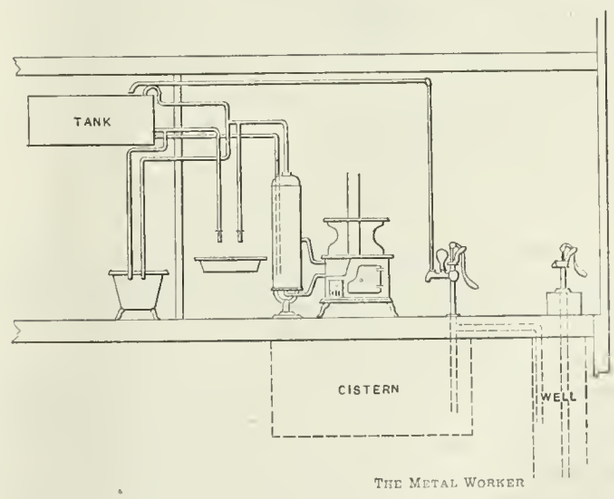
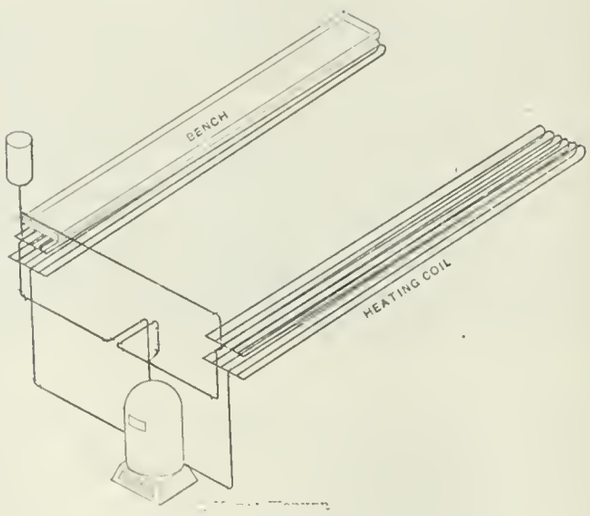


Fig. 2.—Elevation, Showing Piping.

and in case of heavy firing, steam is likely to be generated. In consequence, a small pipe should be carried from the highest point in the hot water pipe and run above the top of the tank, and the end turned down over it. This is to allow for the escape of steam and air. If the piping is arranged somewhat on the general plan given in Fig. 2 there will be no difficulty in securing satisfactory service.

HEATING A GREENHOUSE.

From H. N. S., Halifax, N. S.—I am called upon to heat a small greenhouse, 18 feet long, 12 feet wide, with a pitched roof that is 10 feet high in the center, falling each way to 4-feet walls on the sides. I desire to use a lot of 1-inch and ¾-inch pipe that I have on hand for heating it by means of a hot water system. I desire to connect the pipes with headers connected with the flow main from the heater, shown, and I should like to know what sized water heater I would require? How much should I run for the work to maintain a temperature of 60 degrees when the thermometer is 12 degrees below zero, the building being so situated that it has no protection on any side? Is it necessary to carry back the same number of pipes as is carried from the heater, area for area? Could I lead off with 1-inch pipes and return with ¾-inch, having the same number of each? Or, would it be better to use all of one size? I propose to place the heater under the building so connected with the chimney that there will



Heating a Greenhouse.

be no detriment to the plants from sulphur or gas, and expect with that I will get a good percentage of heat from the fire, though I do not calculate it will aid much in heating the greenhouse proper.

Answer.—In hot water heating it is necessary to have the return pipes of the same capacity as the supply pipes. The size of the boiler will depend on the amount of radiation needed for heating the greenhouse, which is governed by the glass exposure rather than by the cubic contents. We assume that the glass roof of the greenhouse will expose 288 square feet of surface, and that the ends of the greenhouse are also of glass, which would add 120 square feet of glass surface, making a total of 408 square feet of glass surface. If 1 square foot of surface is provided in the heating coil for every 2½ feet of glass surface exposed, it is probable that there will be no difficulty in raising the temperature of the greenhouse to 60 degrees, even with the mercury at 10 degrees below. By dividing the amount of glass surface by 2½ it will be found that about 165 square feet of heating surface will be necessary in the coils, and a heater rated to carry this amount of surface should be provided. Some benefit would be derived, both in economy of fuel and less care in firing, if a heater of 200 square feet capacity is provided, as it will also have to heat the surface exposed in the mains, and the fire can be regulated more readily to do the work. Both 1 and ¾ inch pipe are looked upon as rather small for use in heating greenhouses with hot water. However, if it is desirable to use this pipe return bend coils should be made so as to allow for the expansion and contraction of the pipe connected with the different headers. It would be better to use all 1-inch pipe on one coil, and all ¾-inch pipe in the other coil.

It may aid our correspondent in making these coils to know that 3 lineal feet of 1-inch pipe are required to expose 1 square foot of surface, and that 3.63 lineal feet of ¾-inch pipe expose 1 square foot of surface. If the coil on the more exposed side of the house is made to expose 100 square feet of surface and is made of 1-inch pipe, it would require 300 lineal feet. If the other 65 square feet of surface needed was made of ¾-inch pipe, it would require about 236 lineal feet of pipe. It is probable that the heating coils cannot be made more than 16 feet long, and by dividing the 300 feet of 1-inch pipe by 16 it will be seen that 20 lines of 1-inch pipe will be necessary in the heating coil, and by dividing the 236 lineal feet of ¾-inch pipe by 16 it will be seen that 15 lines of pipe will be necessary. If this is done a 1½-inch flow pipe should be carried from the boiler to the coil made of the 1-inch pipe exposing 100 square feet of surface, while a 1¼-inch pipe may be used in the coil made of ¾-inch pipe. If the flow mains are carried from the heater and connected with the flow headers on the return bend coils and the coils given a downward pitch to the return bends at the far end and a downward pitch carried back to the return header, where return pipes of the same size as the flow pipes are carried back to the heater, there should be no difficulty in the circulation.

A small pipe should be carried to the expansion tank from each flow main at the point where it connects with the flow header. This will serve the double purpose of allowing the air to escape from the heating coil and also to provide for expansion. A smaller pipe should be carried from the 1¼-inch pipe connected with the ¾-inch flow header. If one of the smaller cast iron water heaters that are on the market is used for this work it should have a grate at least 15 inches in diameter, and if the construction provides for the indirect passage of the products of combustion through the heater to the smoke outlet a decided advantage will be had in both efficiency and economy.

FINE PANTRY SINKS.

From J. Wilson, Stamford, Conn.—Do you know of any firm making butlers' pantry sinks of aluminum? For nice plumbing work there is nothing on the market suitable for a pantry sink. The tin soon wears off the copper sink; the porcelain sink looks very nice for a little while, but after long usage becomes rough and discolored. I think a heavy aluminum pantry sink would fill the bill.

Answer.—Owing to the various alkalis and acids that find their way to the pantry sink, aluminum has not been extensively used for plumbing fixtures. Where handsome and more durable sinks than tinned copper are desired, German silver sinks have been extensively used, as their cost is not greatly in excess of tinned copper sinks. Such sinks are made by the John Trageser Steam Copper works, 447 West Twenty-sixth street, and Henry Steeger, 143 East Thirty-first street, New York City.

WANTS INFORMATION ABOUT A SUN MOTOR.

From T. J. W., Holland Patent, N. Y.—If "G. K. E.," who asked in *The Metal Worker* of December 21 for information about a sun motor, will get a copy of the *Scientific American* of March 16, 1901, he will find a description of a solar motor made and operated in California.

WHERE SHOULD CHURCH FURNACE BE LOCATED?

From J. McD., New York City.—In answer to the inquiry of "M. Y.," in *The Metal Worker* of December 28, asking where a church furnace should be located, I would reply as follows: Under the conditions which are specified, place it as near the front door as you conveniently can. Take the cold air from anywhere in the church floor.

TRADE REPORT.

MARKET SUMMARY.

Pig Tin is very dull at former prices.

Copper is still weak and unsettled, with absence of business.

Pig Lead continues dull and weak.

Spelter is quiet and unchanged in price.

Nickel continues firm and unchanged.

Aluminum is active at former prices.

Tin Plates are quiet; jobbers' prices on Cokes and Ternes are lower.

Sheets are still in large demand with no change in prices.

Sheet Copper has been reduced 3c. per lb.

Sheet Zinc is unchanged and in fair demand.

Pig Iron prices are hardening and buying of Foundry Iron is active.

Scrap Iron is moving more freely and prices are firmer.

Scrap Brass and Copper is dull and weak.

Hardware is seasonably quiet, but prices remain firm in most lines.

Plumbers' Supplies are in good demand for the season, with prices firm, except for Brass Goods.

Wrought Iron Pipe continues firm in price and in good demand.

Cast Iron Soil Pipe prices are well maintained.

Registers are somewhat irregular in price.

Tinware is active, and an advance in prices is not unlikely.

Cistern and Pitcher Spout Pumps are strong and may be advanced.

Wire Nails show more firmness; demand is moderate.

Cut Nails are quiet and unchanged.

Wire continues in good demand; prices are not quite firm.

White Lead prices are somewhat irregular.

Linseed Oil is strong and slightly higher.

Spirits Turpentine is quiet and unchanged.

Old Rubber is dull and a shade lower.

METAL MARKET.

NEW YORK, January 3. 1902.

The year opens with the Metal markets in general in an unsatisfactory condition, comparing in this respect very unfavorably with the market for Iron and Steel products. The Copper market is utterly demoralized by the recent slump in that metal. Pig Lead and Pig Tin are both weak, and although the price of Spelter has been well maintained this metal also has shared in the general dullness which characterizes the entire market with the exception of Tin Plates and Sheet Iron, which are strong and in large demand, with an outlook for continued activity and good prices for at least the first half of the present year.

Pig Tin.—Scarcely any business in Pig Tin has been transacted during the past week. The closing of the London Metal Exchange for several days and the consequent absence of London quotations added to the naturally dull conditions, and the market was, for the most part, exceedingly quiet and uninteresting. Prices, however, have recovered slightly since the heavy break of last week, but the market closed easy. Jobbers' prices for Straits Pig in small lots were quoted at 24¼c. to 24¾c. per lb. Arrivals of Pig Tin during the month of December amounted to 3202 tons, and stocks aggregated 2331 tons. The total of Straits shipments to all parts in December was 4105 tons, compared with 3775 tons for December, 1900.

Copper.—The Copper market continues in an unsettled and unsatisfactory condition, with the expectation of a further reduction in the price of the metal. Nominally, prices are unchanged, but they are merely nominal. Rumors about heavy sales at lower figures than those made public were current during the week. These rumors, however, are not given much credence, for buyers, as a rule, are not taking Copper at any figure. It is the belief of the trade that the war among the leading Copper interests has only just begun and, considering the strength of the contestants, it is held that it will be a bitter one. The heavy accumulation of Copper that has caused all the trouble will, of course, figure largely in the strife. One of the chief factors in the struggle stated a day or two ago that cost of production could be considered as the only level of values; and, said he, "we can produce as cheaply as any one else in the business." He added significantly, "We can also use the big stock that every one has been talking about, and which we can afford to give away." Under the conditions there is really no basis of price, and it is almost impossible to give anything like reliable quotations. Lake Ingot is said to be selling in a retail way at about 14c. per lb., and Casting Copper at 13¾c., but these prices are merely incidental.

Sheet Copper.—A reduction of 3c. on the price of Sheet Copper was made by the manufacturers on January 2, bringing it to a base price of 18c. per lb.

Pig Lead.—Since the recent decline in the price of Pig Lead practically no business has been transacted. Consumers are taking the same stand as the consumers of Copper held for some time. They are not buying in advance, and are only taking just sufficient to meet their absolute current requirements. Consequently, there is a practical standstill in this branch of business. Jobbers quote small lots of American Pig at 4.45c. to 4½c. per lb.

Spelter.—This metal is also for the time being a drug on the market. There is practically no business, but prices are without change, good Western brands in small lots being quoted by jobbers at 4⅝c. to 4¾c. per lb.

Sheet Zinc.—The demand for Sheet Zinc is of fair proportions, and prices are unchanged. Jobbers quote 600-lb. lots at 6¾c., and smaller quantities at 7¼c. per lb.

Antimony.—There is no change in this metal. Cookson's in small parcels is quoted at 10½c. to 11c., and Hallett's at 8¼c. to 8¾c. per lb.

Nickel—Is unchanged, continuing on the basis of 60c. to 65c. per lb. for small lots.

Aluminum.—Manufacturers of Aluminum report a continued active and steady demand for this metal. Prices are without change. Small lots of No. 1 Ingot guaranteed 99 per cent. pure rule at 37c. per lb., and 100-lb. lots at 35c.

Tin Plates.—The market for Tin Plates remains quiet and uninteresting, as is usual at this season of the year, although the smaller consumers are said to be purchasing rather more freely than usual. The American Tin Plate Company are taking orders for delivery the first quarter of the year at the figures ruling for some time past. No intimation has yet been given out as to the intentions of the company in regard to orders for the second quarter, but it is believed that no change is likely to occur. Jobbers' prices on Coke Tins, however, have declined more nearly to the normal, in consequence of a slacking of the stringency caused by the short supply of these Plates. American Bessemer Coke Tins, IC, 14 x 20, in small lots, delivered at New York and corresponding points, now rule at about $5 to $5.25 per box. Jobbers' prices are also about 50c. per box less for 20 x 28 Terne Plates. The year opens with favorable conditions for the Tin Plate trade. There is every indication of a continuance of active demand from all quarters. Prices are on a satisfactory basis, and stocks of Plates in both first and second hands are unusually light. The mills are still behind on their contracts and a

steady run is assured for the winter months at all the manufacturing plants.

Sheets.—While the situation in Sheets is not quite as strong as it was some time ago, owing to the coming into the market of some of the newly established mills, which are in some cases offering slight concessions in order to secure trade, the position in regard to supplies of Sheets is as yet unchanged, and retail prices show no softening. The mills have not yet caught up with their back orders, and most of them are well supplied with contracts to carry them through the first three months of the year. The demand for both Black and Galvanized Sheets continues active, and stocks of the more popular sizes are still light. Jobbers' prices are well maintained. No. 27 One Pass Cold Rolled Soft Steel Sheets are quoted at 4c. to 4.05c., and Galvanized Sheets at 65 to 67½ per cent. off the list. Considerable additions to the Sheet producing capacity of the country are gradually coming into operation as the new plants start up. The increase of output thus caused will no doubt have an important bearing upon the future of the Sheet market. But if the consumptive demand continues in as large volume as has been the case for the past few months it will take some time before the production of the Sheet mills outruns the consuming capacity of the country. Consequently, the opinion is generally held in the trade that Sheet prices are likely to hold up well, at least during the first half of the year, especially in view of the strength of the Pig Iron market and the scarcity and firmness of Steel Billets and Bars.

Chicago advices are as follows: New inquiries are coming up, covering large quantities, and the outlook is excellent for a continuance of activity. Prices show no indication of weakness. Small lots of No. 27 Black Sheets from stock are held at 3.50c. to 3.70c. Small lots of Galvanized are maintained at 70 to 70 and 2½.

Old Metals.—The scarcity of Pig Iron is causing more attention to be given to Scrap Iron, which is more active with prices comparatively firm, although without quotable change. Old Metals of other descriptions are dull and weak, especially Scrap Brass and Copper. Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper	per lb.	11 c.
Light and Tinned Copper	per lb.	9½c.
Heavy Brass	per lb.	8 c.
Light Brass	per lb.	6½c.
Lead	per lb.	3¾c.
Tea Lead	per lb.	3¼c.
Zinc	per lb.	2¾c.
No. 1 Pewter	per lb.	16½c.
No. 2 Pewter	per lb.	9 c.
Tin Plate Scrap, per gross ton		$6.00 to $6.50
Wrought Iron Scrap, per gross ton		10.50 to 11.00
Heavy Cast Scrap, per gross ton		10.25 to 10.50
Stove Plate Scrap, per gross ton		8.00 to 8.25
Burnt Iron, per gross ton		5.00 to 5.50

THE PIG IRON MARKET.

The American Iron trade enters the new year with a prospect which could not be better. The tonnage placed for delivery during 1902 is very large, and there is such overwhelming evidence of unparalleled consumption that the continuance of the present very remunerative prices for the first six months is regarded as absolutely assured. The great majority of those who are connected with the Iron industry profess to feel certain that 1902 will go into history as one of its banner years. The present prices of Iron are not high, though they yield a very good profit to all well equipped, well managed plants. They are certainly not checking domestic consumption. Prices of Pig Iron are hardening, and yet the heavy buying of Foundry Iron, widely distributed, continues. A large number of good sales are reported from different leading distributing centers, and an increasing number of makers are showing a disposition to demand higher prices, so that the tendency is moderately upward.

New York.—The only sale of consequence in this district was of a lot of about 2000 tons, taken by a Connecticut foundry, one-half Southern and one-half Lehigh Valley Iron. The furnaces are having a good deal of trouble about fuel, but the founders, too, complain that they are embarrassed in this respect. Some of the Southern furnaces have advanced prices to the basis of $12 for No. 2 Foundry, but one large interest is still naming $11.50. We quote for Northern Irons: No. 1, $16.50 to $17.50 No. 2 X, $16 to $16.50; No. 2 Plain, $15.50 to $16; Tennessee and Alabama brands, No. 1 Foundry, $16 to $16.25; No. 2 Foundry, $15.25 to $15.75; No. 1 Soft, $16 to $16.25; No. 2 Soft, $15.25 to $15.50; No. 3 Foundry, $14.75 to $15; No. 4 Foundry, $14.25 to $14.50.

Chicago.—The output of the local furnaces is still heavily curtailed by the short supply of Coke. More furnaces have been banked in the past week, and unless the fuel supply speedily increases, others will follow their example. The quantity of Foundry Iron now being made in this vicinity is very small. This contributes to the strength of the Pig Iron situation, which is in such a condition that it would be strong even if the local furnaces were able to run as usual. The foundry trade is exceedingly active in all branches and the consumption of Iron is running beyond any previous experience. The foundrymen who are not receiving shipments on contracts made with local furnacemen are compelled to turn to the furnaces in other districts. The demand for spot Iron is heavy and excellent contracts were placed during the week. Some furnaces have advanced their price 50c. per ton during the week, but as yet enough sellers are found at the old rates to justify continuing former quotations. We quote as follows:

Lake Superior Charcoal	$18.50 to $19.25
Local Coke Foundry, No. 1	16.00 to 16.50
Local Coke Foundry, No. 2	15.50 to 16.00
Local Coke Foundry, No. 3	15.00 to 15.50
Local Scotch, No. 1	16.00 to 16.50
Ohio Strong Softeners, No. 1	17.60 to 17.85
Southern Silvery, according to Silicon	16.15 to 16.40
Southern Coke, No. 1	15.65 to 16.15
Southern Coke, No. 2	15.15 to 15.65
Southern Coke, No. 3	14.65 to 15.15
Southern Coke, No. 1 Soft	15.65 to 16.15
Southern Coke, No. 2 Soft	15.15 to 15.65

CHICAGO REPORT.

Scrap Iron and Steel.—Cast Scrap continues in excellent demand, but other kinds of material are quiet. We quote dealers' buying prices for carload lots, Chicago delivery, as follows:

	Per net ton.	
Country Wrought Scrap	$11.00 to	$11.50
Machinery Cast	10.50 to	11.00
Malleable Cast	10.00 to	11.00
Stove Plate (free from burnt)	8.00 to	8.50
Burnt Iron and Grate Bars	5.50 to	6.00
Sheet Iron and Hoops	6.00 to	7.00
Plow Steel	.... to	10.00
Breaking Stock	9.00 to	10.00
No. 2, such as Shovels, Hoes, &c	.... to	7.00
Old Boilers—whole (Iron)	6.50 to	7.00
Old Boilers (Iron) cut in single Sheets and Rings	10.00 to	11.00
Old Gas Pipe and Boiler Tubes	10.50 to	11.00
Cast Borings	4.50 to	5.00
Turnings	9.50 to	10.00
Horseshoes	12.00 to	....

Old Metals.—The movement is very light and will remain so until Copper prices show some degree of firmness. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	10 c.
Copper Bottoms	9 c.
Copper Clips	10 c.
Red Brass	10 c.
Yellow Brass	7½c.
Red Brass Borings	9 c.
Yellow Brass Borings	6½c.
Light Brass	6¼c.
Pipe Lead	3.55c.
Tea Lead	3 c.
Zinc	3 c.
Tin Foil	20 c.
Pewter, No. 1	16 c.
Pewter, No. 2	14 c.

Old Rubber.—Business is dull. We quote as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	46.00	.....
Rubber Shoes	....	7 c.
Rubber Car Springs	....	5½c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6¾c.
Black Rubber	....	4¼c.
White Rubber	....	8½c.

Rags.—Dealers quote buying prices of good Country Mixed Rags, Chicago delivery, at 75c. to 85c. per 100 lbs. in any quantity.

Anthracite Coal.—The demand has fallen off, owing to the prevalence of much milder weather. Prices are unchanged, as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis.	5.75	6.00
St. Louis	6.20	6.45
Kansas City, Mo.	8.25	8.50

THE HARDWARE TRADE.

It is seldom the privilege of an observer of trade conditions to chronicle a more gratifying report than is called for at this time, when there is on the one hand the record of an exceptionally successful year, and on the other a hopeful looking forward to a continuance of existing prosperity. It will be noted that in almost every line sanguine expectations are expressed of a large volume of business the coming year and under conditions which should make it profitable to both merchants and manufacturers. The trade in most leading lines has been such as to reduce to moderate size the stocks of manufacturers and merchants. In fact, in not a few lines it is still difficult to keep up sufficient assortment to meet the needs of the trade. The trouble begins with the manufacturer, who often finds it hard to get material for his goods, and it passes down through the trade, making it incumbent for buyers to do a good deal in the way of hurrying shipments. Prices generally are very firm. The conditions which exist, both at home and abroad, encourage the expectation of a large volume of business during 1902. This seems assured unless some disturbing influence, of which there is no indication, unsettles the situation and induces some element of perplexity or alarm. Thus the old year has closed with a memorable record and the new opens with bright prospects.

NOTES ON PRICES.

Wrought Iron Pipe.—The base prices on Wrought Iron Pipe, Black and Galvanized, have not been changed since September 1, 1900. The list prices have not been changed since February 15, 1900. The prices with the jobbing trade varied considerably during the year 1901 more so than at any period before in the history of the Pipe industry, with the exception of 1899. The Pipe market in the Eastern section was in practically the same condition in the early part of January, 1901, as it is at the present time. Selling prices are practically identical, those prevailing at the present time being not more than 5 per cent. above the prices ruling in January, 1901. Rumors were rife the early part of the year regarding the Pipe situation. All through the month of February it was stated that as soon as the United States Steel Combination were put through the price of Pipe would be advanced. It was said that as the National Tube Company, which is one of the constituent parts of the United States Steel Corporation, controlled more than 90 per cent. of the entire producing capacity of the Wrought Iron Pipe mills of the country, it would be a very easy matter for them to advance prices. Another feature of the anticipated deal, which, it was expected, would affect the Wrought Iron Pipe market, was the fact that the United States Steel Corporation would control all the plants manufacturing Billets and Skelp, from which the independent Pipe manufacturers procured their supplies. The National Tube Company, it was expected, would make the price of Wrought Iron Pipe, and if the independent concerns did not live up to the price established by them then, it was argued, the Steel Corporation would put their prices for Skelp at such a high level that the independent manufacturers would be at their mercy. That there has been no cut in the price of Wrought Iron Pipe is due entirely to the fact that there is a great scarcity of it, and also to the fact that the National Tube Company had a prolonged strike at their mills during the summer. Owing to the heavy demand for Pipe and the pronounced scarcity of supplies premium prices were asked to the jobbers in the late summer, but supplies came in more freely along toward November, and prices gradually returned to the normal. They have remained unchanged since the latter part of November, and it is believed that they will so continue until the latter end of February or the middle of March. It is understood that the product of the leading interest is already sold up to that period, and that all sales have been made at the price which has been in effect for the past 15 months. The general outlook for business in Wrought Iron Pipe during the coming year appears promising. A number of new concerns are about entering the field, however, and keener competition may result. None of the independent mills, it is thought, will break the market.

Cast Iron Soil Pipe.—The condition of the Cast Iron Soil Pipe market has remained practically unchanged since the fore part of January, 1901. At that time the Cast Iron Soil Pipe Association was in its infancy, and, to a large extent, was merely an experiment. Since then, however, the association has improved, and to-day the Association of Soil Pipe Manufacturers is one of the strongest and most stable in the Plumbing Supply business. It includes all the Cast Iron Soil Pipe concerns of the country. There is only a difference of 5 per cent. in the manufacturers' prices to-day from those issued by the association on January 10 last. This advance was made in March, and the prices then issued have since ruled the market. The prices quoted by the jobbers all over the country are identical. On February 23 the list prices were standardized. The demand for Soil Pipe and Fittings was very satisfactory, and in good volume all through last year. The market is very firm at the present time, manufacturers preferring to carry their stocks through the usual dull season rather than dispose of them at concessions in price. A large trade is anticipated for the coming year, as it is expected that a good deal of building will be done over the country generally. The capacity of the foundries is large and in excess of the normal demand, and without agreement between them manufacturers' prices would easily become demoralized in presence of a dull market.

Enameled Bathtubs and Sanitary Ware.—The year 1901 was the most remarkable year in the history of the Enameled Bathtub business. Commencing with the first of the year the manufacturers standardized the lists and discounts of Bathtubs. On January 1, 1901, the Standard Sanitary Mfg. Company put into effect the high lists which had previously been used in the West. These included the lists on the unguaranteed brands and on the regular guaranteed brands. The prices on high grade and special brands remained unchanged. The adoption of the Western or high lists did not mean an increase in price, as the high lists were accompanied with correspondingly high discounts, which made the net equivalents the same as with the low lists and discounts which they superceded. Early there was a slight advance in Enameled Square Kitchen Sinks, Enameled Laundry Trays and Enameled Ware of all kinds. The demand and the increase in the cost of raw material was sufficient at that time to warrant the asking of better prices. A very pronounced scarcity of Bathtubs was developed during the year, and jobbers were put to considerable difficulty in securing goods to meet the demands of their customers. Prices to the retail trade were advanced 10 per cent. in June. There has been no change whatever since then. The trade have not asked for any new prices, being entirely satisfied to get the Tubs at any price. There seems every reason to believe that prices will remain without radical change during the ensuing year. The demand for Tubs to be used during the year 1902 is said to be so large that there will probably be little difficulty in maintaining present prices. All reports concerning Enameled Tubs indicate that 1902 will show the largest product of this class of goods ever put upon the market. A few new manufacturers in this line are preparing to start during the present year. There has been no change in the styles or general appearance of Tubs. It is said that the several new concerns which started up during 1901 are turning out fairly satisfactory ware, considering the small period of time in which they have been engaged in the business, and the slight experience they have had.

Sheet Brass, &c.—At a meeting of the principal manufacturers of Brass, held in New York on Thursday, January 2, a reduction was made in the price of Roll and Sheet Brass, Brass Wire and Rods and Brazed Brass Tubing, the discounts on which were placed as follows:

	Discount.
Roll and Sheet Brass	35 %
Brass Wire and Rods	37½ %
Brazed Brass Tubing	45 %

The reduction was made on account of the decline in price of Copper, but as the price of Brass has relatively been considerably lower than that of Copper, the reduction is naturally not as heavy proportionately as the decline in the raw material.

Registers.—The situation of the market for Hot Air Registers is not as satisfactory as manufacturers would desire. During the spring and summer months the market was in an unsatisfactory condition, with irregularity in prices and considerable divergence in the quotations of the various manufacturers. Competition of comparatively new concerns caused a lowering of prices on the common goods. On September 2 a higher list was adopted by some of the manufacturers. Others, however, together with a number of jobbers, continued the use of the old lists. At present there is no agreement among the manufacturers of Registers in regard to prices. On account of this lack of agreement and of the fact that the capacity of the manufacturers in this line exceeds the normal demand and that there is a large variety in the assortments and quality of goods, there is a good deal of unevenness in prices.

Tinware, &c.—The demand for Tinware, Galvanized Ware and other Sheet Metal household goods has been very active, especially during the past six months, and the great difficulty in obtaining supplies of raw material has contributed to a constant shortage of goods. The question of making deliveries by manufacturers has been of more moment than the question of prices. A continued large demand is anticipated during 1902, with prices no lower than those now ruling, but probably higher. There was talk in the trade this week of an impending advance in Tinware.

Pumps.—While there has been no formal agreement between all the manufacturers of Cistern and Pitcher Spout Pumps, their relations for some time past have been more harmonious than usual. Some reductions were made in the price of Pitcher Spout Pumps last year. The volume of business during 1901 was excellent, and the outlook for the first six months of 1902 is regarded with satisfaction. It is not unlikely that some advance will be made in quotations of Pumps if the price of Iron should move upward.

Building Papers.—Building Papers, including Rosin Sized Sheathings, Water Proof Sheathings, Asbestos Paper and Board, Deafening Felts, Tarred Roofing Paper, &c., were in excellent demand last year. The market has been an open one, and prices ruled low owing to active competition. Raw materials incident to the manufacture of Asbestos Papers have not declined in proportion to the selling prices of the finished product. The prospect is not encouraging for higher prices in the near future, but indications point to a large demand for 1902. It is not thought that there will be any reduction in prices of Asbestos Paper next year, or at least during the first part of the year, and that quotations will be higher rather than lower. There is a large demand for Asbestos Building Paper, which is expected to continue.

Wire Nails.—The absence of lower quotations on Wire Nails for the past two weeks has given the trade more confidence in the stability of the market. It is expected that some large orders will come into the market after the retailers have finished taking their inventories. The course of the market has justified the policy pursued by the trade in purchasing Nails in small lots, but it has resulted, almost universally, in small stocks throughout the country. The Nail market during the week showed its usual holiday dullness. Small lots of Wire Nails from store are quoted at $2.25 to $2.30 per keg. Only one change was made in the regular quotations in Wire Nails during the year. This was when an advance of 10 cents per keg was made by the leading interest. The increased quotation, while not formally changed, was not representative of the market during the latter part of the year, when it became disturbed by new competition. The demand for Nails during the year was very large, although orders in the closing months were, to a considerable extent, confined to small quantities.

Cut Nails.—The demand for Cut Nails is naturally light at this season, and has been curtailed to a greater extent than usual by the low price of Wire Nails. Representatives of the mills are adhering to the price of $2.25 for Nails from store. Jobbers in New York are asking the same price generally, but in some instances are selling 2 cents below these figures. An advance of 10 cents per keg in the price of Cut Nails was made during the year in two sums of 5 cents each. The demand for the past 12 months has been moderate, and the year opens with the market fairly steady, and in an unusual condition in that there is little, if any, difference in the price of Wire Nails, as compared with Cut Nails.

Old Rubber.—The market for Old Rubber is quiet at the present time. Prices rule slightly lower. Dealers in New York and vicinity are paying about the following figures:

Car Springs, ton lots, per lb	5¼c.
Rubber Shoes, less than carloads, per lb	7 c.
White Wringer Rolls, per lb	7¼c.
Inside Bicycle Tubing, per lb	21½c.
Outside Tubing, per lb	6¾c.

White Lead.—The reduction in the wholesale price of White Lead in Oil is being held for the best known brands. In other brands there is also some irregularity in price. White Lead in Oil in a retail way is quoted at 6½ to 6¾ cents per pound. Only one change was made in the price of White Lead during the year, when manufacturers announced on December 20 a reduction of ½ cent per pound.

Linseed Oil.—The demand for Linseed Oil at the present time is confined to small lots. The market is firm at 57 to 58 cents per gallon for City Raw, Boiled Oil being 2 cents advance on Raw. The condition of the Linseed Oil market was unsettled and perplexing during most of the year.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED JANUARY 3, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 37¢
100-lb lots.....₩ lb, 35¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than	6-in.	14-in.	24-in.
And including	14-in	24-in.	30-in.
	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19	$0.42	$0.44	$0.47
" 20	.44	.46	.49
" 21 to 23	.46	.48	.51
" 24	.48	.50	.53
" 25	.47	.51	.54
" 26	.47	.54	.59
" 27	.48	.57	.62
" 28	.48	.57	.64
" 29	.49	.60	.69
" 30	.50	.64	.77

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb. 10½@11¢
Hallett's.....₩ lb. 8¼@8½¢
U.S.....₩ lb 8 @8½¢

Brass, Roll and Sheet..15@20%

Conductors—Corrugated.

Round or Square.—

Galvanized ½ or more. N'st'd.....70&5%
" Not Nested.....70&2½%
" Plain Round, ½ or more, Nested.....70&5%
Galvanized, Plain Round, Not Nested. 70&2½%

Spiral Riveted.

Galvanized.....40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—

See *Strainers, Conductor.*

Copper—

Lake Ingot.....14 @14½¢
Casting.....13¾@14 ¢
Sheet and Bolt.....21¢ ₩ lb basis
Cold Rolled Sheets.....22¢ ₩ lb basis
Cold Rolled and Polished Sheets.....23¢ basis
Planished Sheets.....24¢ basis
Bottoms, Pits and Flats....₩ lb 25¢ basis

Eave Trough, Galvanized

Territory.	L. C. L.	
Eastern	75&10%	Carloads extra 12½%
Central	75&7½%	
Southern	70&12½%	
S. Western	70&10%	

Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Eastern List.

Tin.....30%
Galvanized.....30%
Perfect Elbows.....40%

Stove Pipe—

Four-Piece

	4	4½	5	5½	6-inch.
No. 1.	$0.80	.85	.90	1.00	1.05 per doz.
No. 2.	.65	.70	.75	.80	.85 "
No. 3.	.60	.63	.65	.70	.80 "

Elbows and Shoes—

Galvanized.....60%

Gasoline—

See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, Soft Steel.	R. G. Cleaned.
Nos. 14 to 16	₩ lb, 3.65	3.70¢
Nos. 18 to 21	₩ lb, 3.75	3.80¢
Nos. 22 to 24	₩ lb, 3.85	3.90¢
Nos. 25 and 26	₩ lb, 3.95	4.00¢
No. 27	₩ lb, 4.05	4.10¢
No. 28	₩ lb, 4.15	4.20¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb 11@14 ¢
Do. Stained.....6@10½¢
Patent Planished. ₩ lb A, 12¢; B, 11¢ net

Galvanized.

Nos. 10 to 16	₩ lb, 12¢	65@67½% off
Nos. 17 to 21.	₩ lb, 13¢	
Nos. 22 to 24	₩ lb, 14¢	
Nos. 25 to 26	₩ lb, 15¢	
No. 27	₩ lb, 16¢	
No. 28	₩ lb, 17¢	
No. 29	₩ lb, 19¢	
No. 30	₩ lb, 21¢	

36 in. 1¢ ₩ lb higher.

Lead—

American Pig.....4.45@4½¢
Bar.....5@5½¢
Pipe.....6¾¢.....20% off
Tin Lined Pipe.....12½¢.....20% off
Block Tin Pipe.....37½¢.....20% off
Sheet Lead, full rolls... 7¼¢ .....20% off
Sheet Lead, cut.....7¾¢.....20% off
Old Lead in exchange, 1¢ ₩ lb.

Mitres, Eave Trough—

See *Eave Trough Mitres.*

Nickel—

Per lb.....60@65¢

Paints, Oils, &c.—

Leads—

Lead, American White, in Oil;
Lots of 500 lb or over.....6¼ @ 6½
Lots less than 500 lb.....6½ @ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price..... @ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price..... @ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price.. @ 1½
Lead, White, Dry in bbls.....5¾ @ 6
Lead, Red, bbls., ½ bbls. and kegs:
Lots 500 lb or over..... @ 6
Lots less than 500 lb ..... @ 6½

Oils—

Linseed, City, raw.....₩ gal.....67@58¢
Linseed, City, boiled.....59@56¢
Linseed State and West'n, raw..53@56¢

Spirits Turpentine—

In Southern bbls.....38½@39 ¢
In machine bbls.....40 @40½¢

Putty—

In bulk.....$1.25
In bladders..... 2.25
In cans 12 lb to 25 lb..... 2.25
In cans 1 lb to 5 lb..... 3.25

Petroleum Products—

In Barrels (Barrel Included)

Stove Gasoline.....₩ gal. 12½@13¢
Kerosene.....₩ gal. 13@13½¢

Pipe, Drain.....40%

Pipe, Spiral—

See *Conductors.*

Registers—

List Sept. 2, 1901.

Black Japanned.....60&10@60&10&5%
White Japanned.....60&10@60&10&5%
Nickel Plated.....60&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....60&10@60&10&5%
Electroplated in Brass, Bronze or Copper.....60&10@60&10&5%
White Porcelain.....60%
Solid Brass and Bronze Metal.....50%

Roofing Material—

1 Ply Tarred Paper. ₩ ton.$26.00@28.00
2 Ply Tarred Paper...₩ roll, 108 sq. ft. 45@50¢
3 Ply Tarred Paper..₩ roll, 108 sq. ft. 65@75¢
Slater's Felt.....roll 500 sq. ft., 50@60¢
Roofing Pitch.....₩ bbl. $2.38

Rosin—

Common and Good—Strained.

Rosin, C. & D.	₩ bbl. $1.50	@$1.55
Rosin, E. & F.	₩ bbl. 1.60	@ 1.65
Rosin, G. & H	₩ bbl. 1.70	@ 1.75
Rosin, I. & K	₩ bbl. 1.80	@ 2.40
Rosin, M. & N.	₩ bbl. 2.90	@ 3.50

Shoes and Elbows—

See *Elbows and Shoes.*

Slate Roofing—

f. o. b. cars, Quarry Station. According to size.

Pennsylvania:	
Best Bangor, ₩ sqr.	$3.25@$4.50
No. 1 Bangor Ribbon. ₩ sq	3.00@ 3.50
Pen Argyle, ₩ sqr.	8.00@ 3.75
Peach Bottom, ₩ sqr.	4.85@ 5.60
No. 1 Boys, ₩ sqr.	3.35@ 3.55
No. 1 Chapman Keystone, ₩ sqr.	3.25@ 4.25
Vermont:	
Sea Green, ₩ sqr.	$2.00@$3.15
Purple, ₩ sqr.	3.75@ 4.25
Unfading Green, ₩ sqr.	3.25@ 4.50
Red, ₩ sqr.	6.50@11.00
Maine:	
Brownville, Unfading Black:	
No. 1 quality.	$5.25@7.50
No. 2 quality.	$4.25@6.00

Solder—

½&½ guaranteed.....17 @17½¢
No. 1.....14½@16 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	Per Pound. Barrels	Smaller Q'ntities
Concentrated Flux	4c	5c
Eureka Flux:		
Triple Strength	3c	3½c
Extra Concentrated	4½c	5c
Crystal	..	7c
Gedney's Fluid	2c	2c
Lennox Fluid	2c	3c
Perfection Flux	3c	3½@4c
Yager's Salts, 1 lb. bottles		each, 50¢
5 lb. bottles, per lb., 45¢		

Soldering Coppers—

Per lb.....22@24¢

Spelter—

Western Spelter.....4½@4¾¢

Spiral Pipe—

See *Conductors.*

Stove Pipe Elbows—

See *Elbows, Stove Pipe.*

Stove Trucks—

See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....50%

Tin Pigs and Bars—

Banca, pigs, ₩ lb.....24¼@24¾¢
Straits, pigs, ₩ lb.....24¼@24¾¢
Straits, in bars, ₩ lb.....25¼@25¾¢

Tin Plates, American Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:		
IC,	14 x 20	$7.50
IX,	14 x 20	9.00
IXX,	14 x 20	10.25
IXXX,	14 x 20	11.50
IXXXX.	14 x 20	12.75
Melyn Grade:		
IC,	14 x 20	7.00
IX,	14 x 20	8.50
IXX,	14 x 20	9.75
IXXX.	14 x 20	11.00
IXXXX	14 x 20	12.25
Allaway Grade:		
IC,	14 x 20	6.50
IX,	14 x 20	7.60
IXX,	14 x 20	8.70
IXXX,	14 x 20	9.80
IXXXX,	14 x 20.	10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight } IC, 14 x 20.....$5.00@5.25
" IX, 14 x 20.....$6.00@6.25

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb	15¢
95 lb	20¢
90 lb	25¢
85 lb	30¢

Terne Plates—

N. B.—The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $3 per box advance for 8 to 10 lb coating and $2.50 to $3 advance for 15 lb and upward.

About 40 lb coating	$16.00@16.50
About 30 lb coating	15.25@15.75
About 20 lb coating	13.25@13.75
About 15 lb coating	11.25@11.75
About 8 lb coating	@10.00

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)	$12.50
IXX, 14 x 28..(112 sheets)	13.50
IXX, 14 x 31..(112 sheets)	15.00

Troughs, Eave—

See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubes and Tubing—

Brazed Brass, List Feb. 26, 1896.30@35%
Copper and Bronze, 3c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb. 6, 1899.
Tin.....50%
Galvanized.....50%
Fittings for do.....40%

Zinc—

600 lb casks ₩ lb.....6¾¢
Per lb.....7¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
30 gal.....70&10%
35 and 40 gal.....70%
Other sizes up to 52 gal....60@60&10%
52 gal. and above.....60%
Extra Heavy Boilers:
18 to 52 gal.....60%
53 gal. and above.....55%

Brass Work, Plumbers'—

List of December 7, 1896.

Compression:
Basin Cocks.....60%
Bath Cocks and Double Bath Cocks.....65%
Bibs.....65%
Bibs, Flanged.....65%
Fuller:
Bibs.....70%
Basin Cocks, Nos. 1 to 4.....70%
Bath Cocks, No. 4½.....$2.40 each net
Ground Key Work:
Finished Bibs.....55&5%
Rough Bibs and Stops.....70%
Rough Stop and Stop and Waste Cocks.....70@70&5%
Rough Stop and Stop and Waste Cocks, Patented.....65@65&5%

Miscellaneous—

Basin Clamps.....60@65%
Basin Plugs.....60@65%
Chain Stays.....60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face, ₩ set	$0.95	$1.05
Ground Face ₩ set	1.00	1.10

Sink or Bath and Wash Tray Plugs.60@65%
Soldering Nipples.....70&5@75%
Soldering Unions.....70&5@75%
Union Elbows, Hot Water Heating.....75@75&15%

Cocks, Valves, &c.—

Cocks—

Brass—

Air and Radiator Air.....75@75&5%
Gas Meter and Union Meter.....65@70%
Steam.....65@70%

Iron—

All Iron.....70@70&10%
Iron with Brass Plugs.....65@70%

Valves—

Brass—

Check.....65@70%
Garden Hose.....65&10@70%
Gate.....65@65&10%
Globe and Angle, hose outlet.65@65&10%
Globe, Angle and Cross...65&10@70&5%
Horizontal, Vertical and Angle Check.....65@65&10%
Hot Water Radiator.....75%
Radiator.....70&10%
Safety.....65%
Safety, Low Pressure.....65%
Jenkins' Disc:
Check.....65%
Gate.....65%
Globe, Angle and Cross.....70%
Radiator.....80%
Radiator, Corner.....75%
Safety.....65%

Iron—

Iron Body.....70@70&5%
Foot.....65@70%
Jenkins Bros.':
All Iron, except Gate.....40&5%
All Iron Gate.....35@40%
Iron Body, except Gate.....60%
Iron Body Gate.....50@50&5%
Swing Check.....50%

Earthenware—

Brown Glazed.....20%
Porcelain, List of Aug. 15, 1901: Class
Basins, Urinals and Hoppers.... A, 30%
Closet Bowls, Sundries, Washouts and Pedestals..... B, 40%
C, 50%

Fittings—

Brass Fittings—

Finished.....70@75%
Rough.....70@75%
Bushings.....70@75%
Nipples.....70@70&2½%
Unions, Rough and Finished....70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....65@70%
Cast Iron Bushings and Plugs....65@75%
Cast Iron Flanges.....65@70%
Cast Iron Floor Flanges.....65@75%
Malleable Iron Fittings.....70@75%
" " Bushings.....70@70&10%
" " Unions.....70&10@75%
" " Unions, Flange 60&10@70%
" " Pipe Hangers, Universal 50%
Wrought Iron Nipples.....70@75%
" " Couplings.....60@65%
" " Long Screws.....50@65%

Lavatories—

Porcelain Enameled Iron.....30@30&10%

Oakum—

Plumbers' Oakum, 50 lb. bales, ₩ lb 2½¢

Pipe—

Brass, Iron Pipe Size—

⅛	¼	⅜	¾ to 3 Inch
$0.38	.34	.29	.23 ₩ lb

Cast Iron Soil—

List Feb. 25, 1901.
2 to 6 inch inclusive.

Standard.....60@60&10%
Extra Heavy.....65@70%
All Fittings.....70@75%

Wrought Iron—

List Feb. 15, 1900.

	Black.	Galv.
⅛ to ¼ inch	57%	48%
⅜ to 12 inch	64%	51%

NOTE.—*Manufacturers' prices are much lower than above, but prompt shipments are not obtainable.*

Radiators—

Standard List.

Steam.....50&2½%
Hot Water.....50%

Sinks, Etc.—Cast Iron—

	Black.	Galv.
Sinks, Square, Half Round and Corner	60@65%	60@65%
Sink Legs	60%	60@65%
Sink Backs	60%	60@65%
Boiler Stands, Cast Iron	60@60&10%	
Cesspools, Cast Iron	60%	

Wrought Steel Sinks—

New Era, Galv'd and Enameled...70&5%
New Era, Painted.....50&10%
L. & G.....50%

Traps—

Drawn Lead Traps, List June 8, 1901.....50@50&10%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns, Guaranteed, 45@50%
All Special Patterns.....25%
Non-Guaranteed Brands, complete line.....45@50%
Solid Copper, list of Feb. 1, 1899.....40%
Solid Porcelain—Class A, 30%; B, 40%; C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899.....45@50%

ALPHABETICAL LIST OF ADVERTISERS.

Æolipyle Co..... 19
Allbe, Chas. A..... 25
American Distributing Co.....23
American Radiator Co..... 19
American Sheet Steel Co..... 1
American Tin Plate Co..... 76
Anderson Coupling Co..... 25
Arcade Mfg. Co..... 22
Armstrong Mfg. Co..... 24
Asheville Mica Co..... 23
Asphalt Ready Roofing Co .. 77
Barstow Stove Co..... 84
Beckwith, P. D., Est. of..... 2
Berger Bros. Co..... 74
Berger, L. D..... 81
Berger Mfg. Co..... 78
Berestrom Bros. & Co..... 14
Bertsch & Co..... 82
Bliss, E. W. Co..... 82
Blodgett, G. S. Co..... 18
Boss Washing Machine Co.... 72
Brand Stove Co..... 8
Bray, J & Co..... 74
Bridgeport Crucible Co..... 20
Brien Heater Co..... 18
Brooklyn Metal Ceiling Co.... 79
Bruce & Cook.....77&84
Burton, W. J. & Co..... 20
Callahan, Geo. & Co..... 70
Cambridge Rolling Mill Co... 76
Canton Steel Roofing Co..... 79
Carroll, J. B..... 25
Chamber of Commerce..... 70
Champion Steel Range Co.... 18
Cheney, S. & Son..... 1
Cincinnati Stamping Co..... 80
Clark, Henry N. Co..... 21
Clark Novelty Co..... 72
Clark, Quien & Morse..... 75
Clason Arch. Metal Works... 74
Clayton & Lambert Mfg. Co.. 25
Clough, R. M..... 81
Coe, Jas. A. & Co..... 77
Colwell Lead Co..... 23
Cooney & Geiger..... 73
Cope, Geo. W..... 20
Cortright Metal Roofing Co... 80
Crosby Steam Gage & Valve Co..... 1
Curtis & Curtis Co..... 24
Danzer Metal Works..... 80
Day Metallic Mfg. Co..... 25
Detroit Stove Works..... 12
Dighton Furnace Co..... 16
Dixon, Jos. Crucible Co..... 23
Double Truss Cornice Brake Co..... 80
Dowman Mfg. Co..... 73
Drake, W. H..... 20
Drouve, G. Co..... 76
Edwards, J. H..... 23
Eller, J. H. & Co..... 79
Energy Elevator Co..... 23
Enterprise Stove Co..... 12
Fenn, Geo. E..... 73
Floyd, Wells & Co..... 15
Follansbee Bros. Co..... 1
Foster, F. W. Mfg Co..... 24
Friedley & Voshardt..... 78
Frink, I. P..... 84
Front Rank Steel Furnace Co 16
Fuller & Warren Co..... 1
Galt, John & Sons..... 71
Garry Iron & Steel Co..... 79
Garvin Machine Co..... 81
Genuine Bangor Slate Co..... 74
Globe Ventilator Co..... 73
Gobeille Pattern Co..... 21
Gorton & Lidgerwood Co..... 1
Gnmmey, McFarland & Co... 75
Gurney & Co..... 17
Gurney Heater Mfg. Co..... 15
Hamlin, G. R..... 70
Harrington & King Perforating Co..... 66
Hart & Crouse Co..... 14
Hoffman, Geo. W..... 20
Howard Thermostat Co..... 17
Howes, S. M. Co..... 22
Howson & Howson..... 70
Independent Register Co..... 20
International Correspondence Schools..... 70
Internatioaal Heater Co..... 8
Iwan Bros..... 73
Janney, Steinmetz & Co..... 76
Jenkins Bros..... 1
Johnson, E. J. & Co..... 74
Keene, Geo. C. & Co..... 83
Kelsey Furnace Co..... 26
Kemp, C. M. Mfg. Co..... 25
Kewanee Boiler Co..... 16
Kieley & Mueller..... 1
Kirk Mfg. Co..... 22
Koven, L. O. & Bro..... 24
Kramer Bros..... 73
Lamb & Ritchie..... 25
Lawless, John H..... 23
Lawrence-Letts Elbow Co.... 22
Lennox Machine Co..... 20
M & D Range Co..... 11
McClure & Co..... 84
McLain, J. H. Co..... 19
McLeod & Henry Co..... 1
McSherry, Chas..... 80
Magee Furnace Co.....1&8
Marcy Stove Repair Co..... 22
Marlin & Co..... 78
Marston, I. G. & Co..... 23
Meurer Bros. Co..... 75
Michigan Stove Co.....4&5
Millar, Chas. & Son Co..... 84
Millers Falls Co..... 83
Milwaukee Pattern Works.... 20
Miner & Peck Mfg. Co..... 23
Monarch Stove & Mfg. Co..... 9
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Drouve, G. Co., Bridgeport, Conn.

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Galt, Jno. & Sons, 253 Broadway, N. Y.
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Dixon, Jos. Crucible Co., Jersey City, N. J.

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Rutland Fire Clay Co., Rutland, Vt.
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Williams Stove Lining Co., Taunton, Mass.

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Milwaukee Pattern Works, Milwaukee, Wis.
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Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Smith & Anthony Co., Boston, Mass.
Stamford Foundry Co., Stamford, Ct.
Weir Stove Co., Taunton, Mass.

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Detroit Stove Works, Detroit, Mich.
Dighton Furnace Co., Taunton, Mass.
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Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

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Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, O
Standard Lighting Co., Cleveland, O.

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American Radiator Co., Chicago, Ill.

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American Tin Plate Co., New York.

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Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn N. Y.
Weiss, H. & Co., 20 Cliff St., N. Y.

Tinners' Trimmings.

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Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
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Iwan Bros., Streator, Ill.
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Rosen, D. J., 439 Canal St., N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

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Water Closets.

Colwell Lead Co., 63 Centre St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Water Fronts.

Clark, Henry N. Co., Boston, Mass.

Water Heaters.

Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.

Miner & Peck Mfg. Co., NewHaven, Ct.

Wiping Cloths.

Albe, Chas. A., Springfield, Mass

SEE ALPHABETICAL INDEX, PAGE 66.

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An all around man for country shop; married man preferred; to the right man the job will be steady by the year; would rather have man to stay five years than one; wages $11 per week; rent and living cheap. Wm. C. Cook, Branchville, N. J. Jan. 4

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Bright young men, unmarried, who would like to learn the tin and sheet iron business; those with some knowledge of the business preferred; steady work and advancement according to ability; young men who would be willing to learn to erect work on the road. Apply to Box 428, Hartford, Conn. Jan. 4

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PLUMBER who can do tin work; must be temperate and steady; a good job the year round for a man who can do the work; state age, experience and wages wanted; references required. "H. G.," care *The Metal Worker,* New York. Dec. 28

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By TINNER that understands plumbing, gas fitting, furnace and a fair knowledge of steam and hot water work; 13 years' experience; location in Northern Iowa preferred. Lock Box 207, Olin, Iowa. Jan. 4

As FOREMAN by practical corniceman, competent to run shop and make it pay. Adolf Klein, 403 East Eleventh street, New York. Jan. 4

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By a young man with five years' experience in the retail hardware business; desires good position as CLERK; open for engagement to go anywhere; can come with the very best of reference. Box 372, Mt. Morris, N. Y. Jan. 4

Young man, strictly temperate and industrious, with about five years' experience at plumbing and jobbing, desires position in good shop with prospects for future; 25 years of age and willing to go anywhere. "W. H. C.," care *The Metal Worker,* New York. Jan. 4

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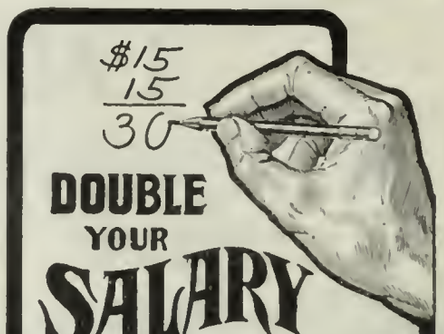
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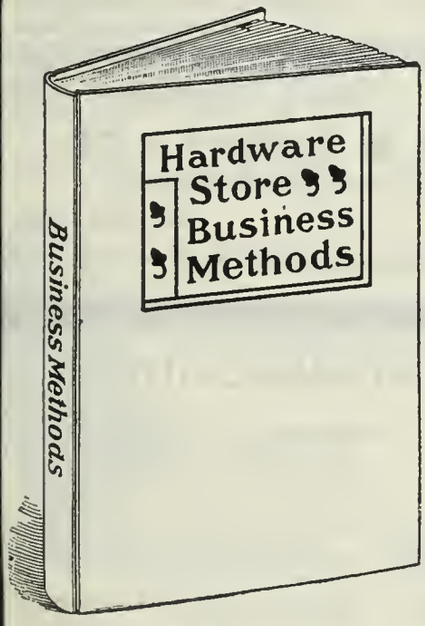
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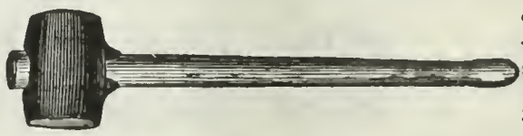
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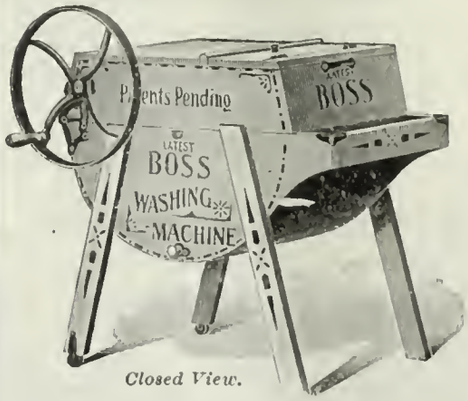
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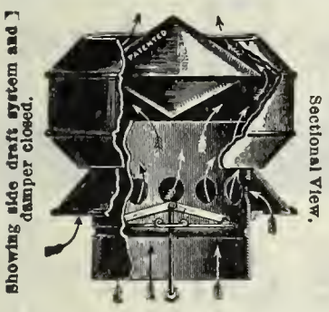
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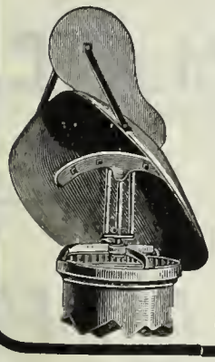
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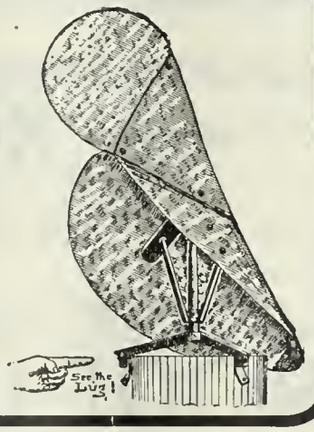
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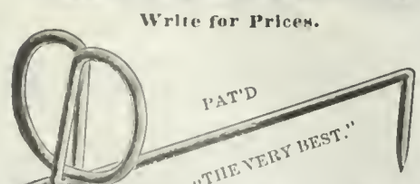
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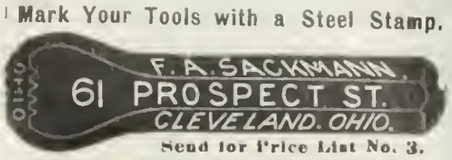
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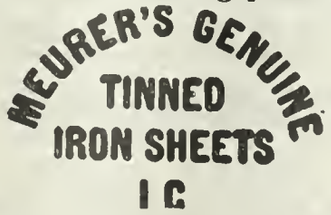
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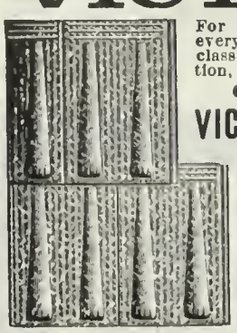
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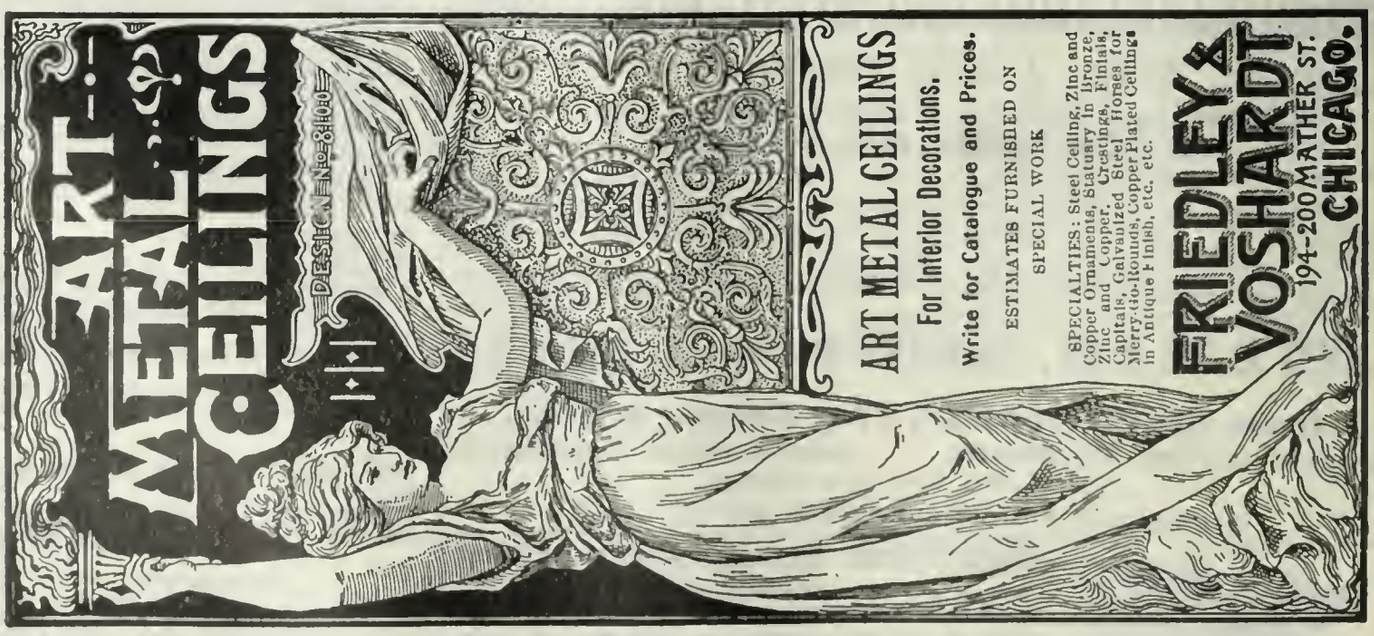
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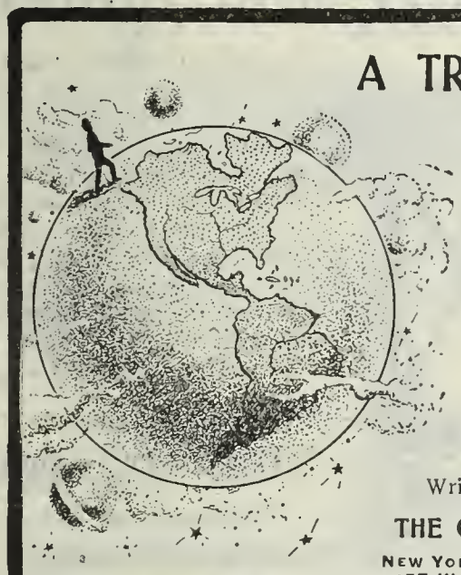
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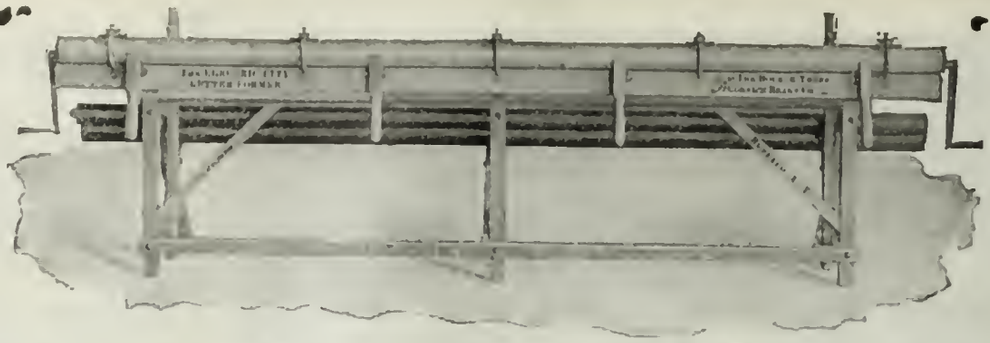
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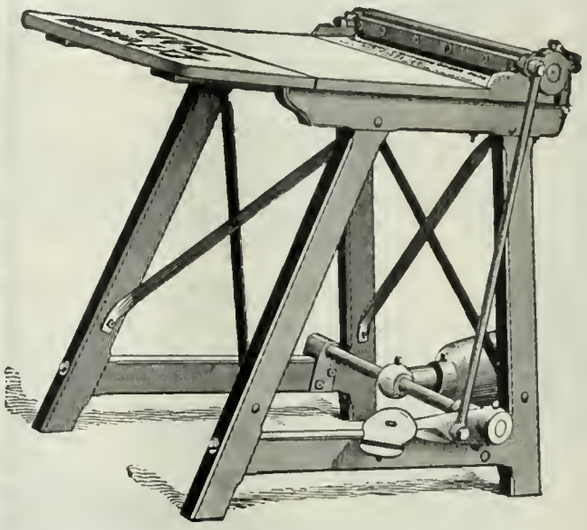
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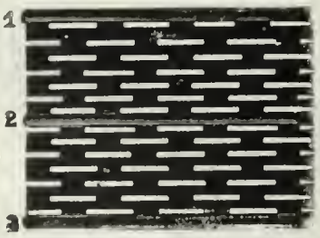
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JOHN SANBORN
DEALER IN METALS,

and manufacturer of Refined Metal Solder, Wire Solder, Piano Key Leads, Babbitt Metal, Pig and Bar Lead,
217 Water Street,
Near Beekman Street, New York.



W. R. OSTRANDER & CO.,

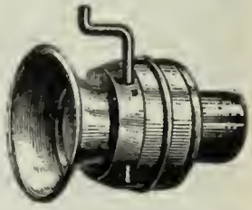
22 DEY STREET, NEW YORK

Manufacturers of

Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I.

CATALOGUES ON APPLICATION





30-INCH EXCELSIOR SHEARS, WITH DROP TABLES.

The Largest Variety of Squaring Shears for Foot and Power.

Cutting Length from 2 to 11 feet.
Capacities from the lightest sheets up to 1-4 inch stock.

MODERN CONSTRUCTION. BEST WORKMANSHIP.

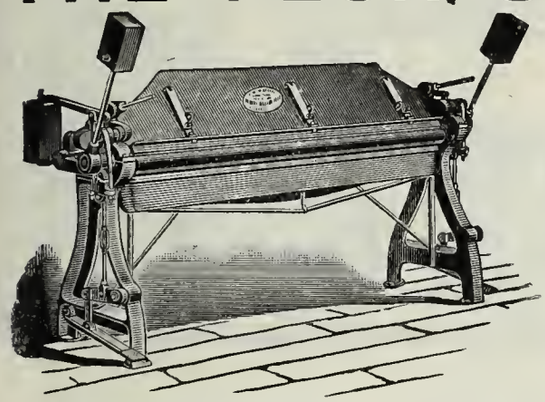
MADE BY

NIAGARA MACHINE & TOOL WORKS,

BUFFALO, N. Y.

THE PECK, STOW & WILCOX CO.,

New York,
—AND—
Cleveland, Ohio.

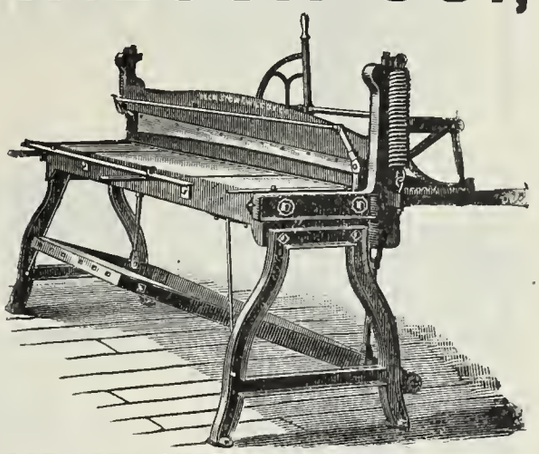


HARE'S FOUR LEAF CORNICE BRAKE.

Hundreds sold and never a complaint. Works easily and rapidly. The universal verdict is, IT IS THE BEST IN THE WORLD.
96 inches long.

Tinsmiths' Tools of the Highest Grade.

Our *Improved Eureka Cornice Brake.* Will bend No. 20 iron.
96 inches long.



CORNICE MAKERS' SQUARING SHEARS.
With Lever Arc, Automatic Gauge. Will cut No. 22 iron.
97 inches long.

For Immediate Delivery : : :



LARGE STOCK OF

PUNCH PRESSES AND SHEARS,

CONSISTING OF

Foot and Power Presses, Hand Punches and Shears, Rotary and Squaring Shears, etc., etc.

BEST MAKES ONLY. SEND FOR CATALOG 1.

THE GARVIN MACHINE CO.,

51 No. 7th St., PHILA., PA. Spring and Varick Sts., NEW YORK.

20th Century Groover

for Hand Power. We also make them for Belt Power.



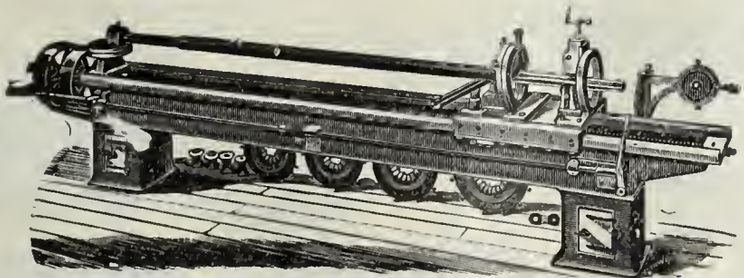
20th CENTURY GROOVER. Handiest out.

Operated from one position. Automatic knock-out and *Quick Return*. Grooves 22 gauge.
Write for circular. Made by
W. A. WHEELER, Indianapolis, Ind.

THE POORMAN MANUFACTURING CO., Piqua, Ohio.

Latest and Most Perfect Machinery on the Market for Manufacturing

CONDUCTOR PIPE AND EAVES TROUGH, Corrugating Machinery, Power Squaring Shears, 36 inches to 11 feet; Beading Machines, Forming Rolls, Curving Rolls, Crimping Rolls, Grooving Machines, Tinners' Squaring Shears, Power Cornice Presses, Improved Metal Roofing Machinery, Paint Machines, Etc.



Latest Improved 10-foot Plain Round, Round Corrugated and Square Corrugated Conductor Pipe Machine.

IT WILL PAY YOU TO GET OUR PRICES ON ABOVE MACHINERY.

COPPER Lightning Rods ...

Absolute Protection from Lightning is given by use of our continuous copper conductors.

E. G. WASHBURNE & CO.,
Telephone, 25 Cortlandt. 46 Cortlandt St. New York.
Work put up or material furnished.





E. W. BLISS CO.,

MAIN OFFICE: 16 ADAMS ST., BROOKLYN, N. Y.

European Headquarters: 12 Ave. De La Grande Armee, Paris, France.

Designers and Builders of Presses, Dies, Shears, Slitters, Double Seamers, Crimpers, etc., etc., for working all kinds of Sheet Metals.

A few of the many articles for which we make the complete machinery for producing are shown in the accompanying cuts.

ALSO OWNERS OF **THE STILES & PARKER PRESS CO.**

ELBOW PATTERNS

Developed on heavy detail paper, giving full size patterns for **Two, Three** and **Four** piece Elbows, from

2 to 20 Inch

inclusive. Sixty patterns in all accurately laid out,

ONE DOLLAR.

POST OR EXPRESSAGE PAID.

David Williams Company,

232-238 William Street,

New York.

GEO. A. OHL & CO.,

157, 159, 161 ORATON ST., NEWARK, N. J.

(TELEPHONE 873.)

Mfrs. of All Kinds of

Metal Workers' Machines,

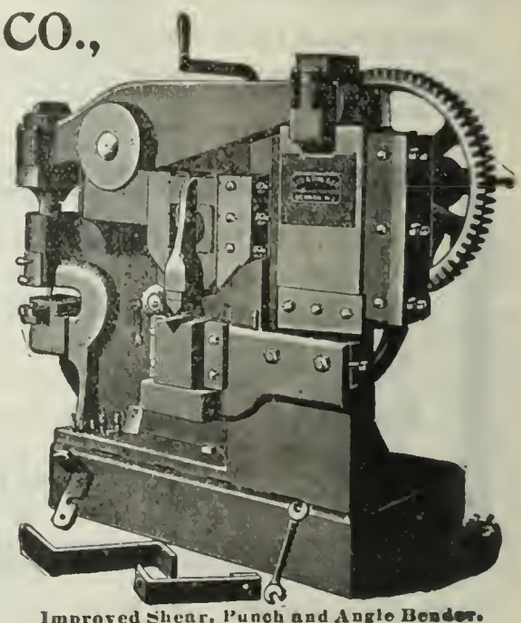
BRAKES

(all sizes),

Heavy and Light

Squaring Shears,

Punches, Presses, Sheet Steel Lath Machines, Drop Presses, Draw Benches, and *SPECIAL MACHINERY* of all descripions.

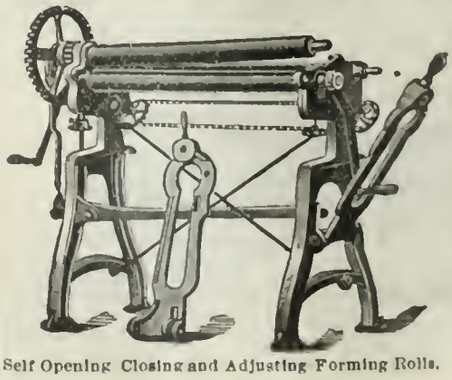


Improved Shear, Punch and Angle Bender.

METAL WORKING MACHINERY

Of Every Description Furnished on Short Notice.

STOCK MACHINES FOR ALL PURPOSES.



Self Opening Closing and Adjusting Forming Rolls.

Practical, Rapid, Cheap.

Always Ready for Prompt Shipment

Write for descriptive circulars and prices.



BERTSCH & CO.,

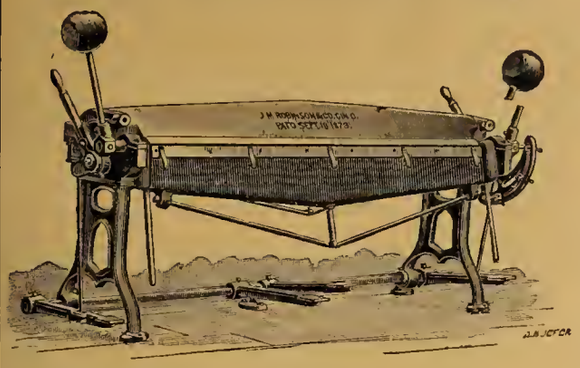
Cambridge City, INDIANA, U. S. A.

Agents: MERCHANT & CO., Phila. Pa.

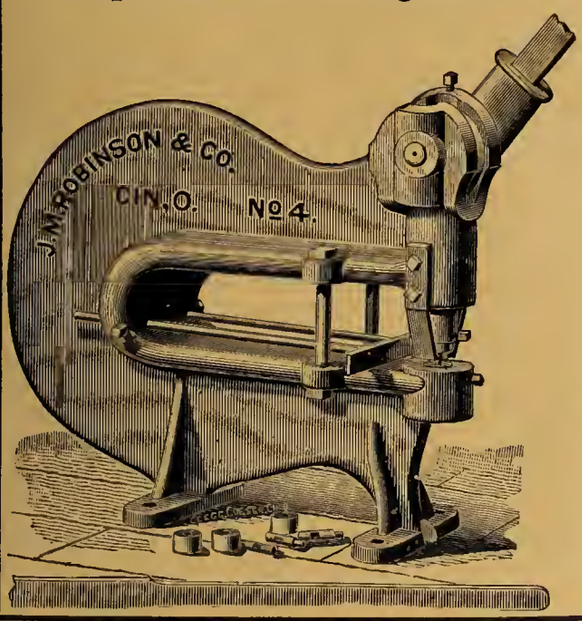
—TWO KINDS OF THEM.—"What is a book worm, Uncle Jack?"

"It is a person who would rather read than eat; or it is a worm that would rather eat than read."—*Indianapolis Journal.*

Double Eccentric Cornice Brake.



Deep Throat Punching Press.



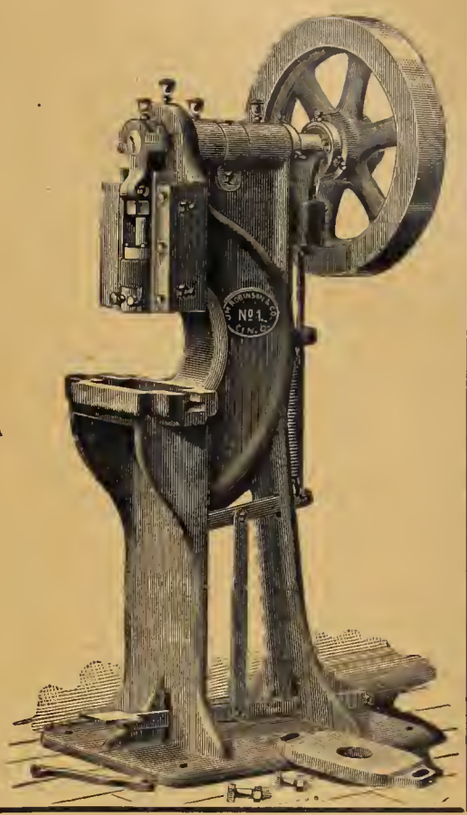
Punching Press

Sheet Metal Working Machinery

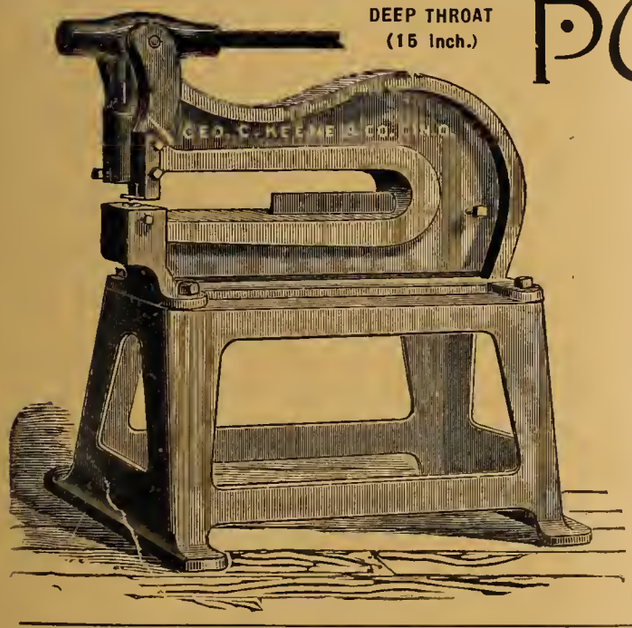
of all kinds manufactured by

THE J. M. ROBINSON MFG. CO.,

225-229 W. 2d St.,
Cincinnati,
Ohio.



DEEP THROAT (15 inch.)



PUNCH.

Double Action.

Strong, easy of operation, cheap. Will punch ¼ inch hole through No. 10 iron or steel and lighter.

GEO. C. KEENE & CO.,
Mfrs. The Keene Brake,
CINCINNATI, - OHIO



THIS SHEAR is made to work by either hand or foot power or both; with hand lever either right or left hand side. Made plain or with gauges. Cuts ¼ in. stock and thinner. Send for circulars of shears and punches if in need.

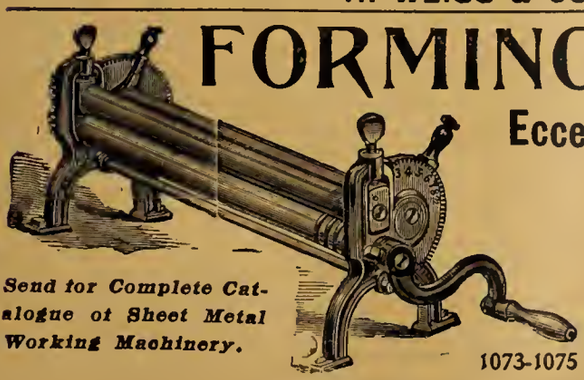
R. M. CLOUGH,
TOLLAND,
CONN.
Combination Shear.

PHILADELPHIA MACHINE TOOL CO.,
445 North Darien St., Phila., Pa.
TESTING MACHINES and *SOLE AGENTS* for HENNING TESTING APPARATUS.
PRESSES and SHEARS, CORNICE PRESSES, CURVED MOULDING MACHINES, etc.

TINNERS' TOOLS, MACHINES and SUPPLIES. Plumbers' Tools, Tinners' Hdwe., Soldering Flux, Salts, Coppers, Rosin, Roofing Cement, Rivets, Bolts Screws, Slaters' Tools, Second-hand Machinery and **SKYLIGHT GEARING**
H. WEISS & CO., 20 Cliff St., N. Y.

FORMING ROLLS

Eccentric Adjustment



The advantage in using this machine is the quick adjustment of the hack roll by means of graduated eccentrics.

Send for Complete Catalogue of Sheet Metal Working Machinery.

OLIVER POCOCK,
1073-1075 Clark St., Cincinnati, O., U. S. A.

★ SAWS ★

Our Star Hack Saws are now used in nearly all Iron-working Shops the world over. They are equally useful for farmers and men in all departments of life. They will cut iron and wood equally well. A nail does not dull them at all. One blade, which costs five cents, will cut off an inch square bar of iron 200 times without sharpening. We have cut off such a bar 387 times with one blade. All hardware dealers will furnish these saws. If not, we will send one steel frame and six blades by mail, prepaid, on receipt of $1.00.
All good blades are stamped with a ★
MILLERS FALLS CO., 28 Warren St., N. Y.

—INSULT AND INJURY.—Stubb: "It was mean in that winning cyclist to drop bottles along the track for the purpose of taunting his rival."
Penn: "What was in the bottles?"
Stubb: "Catchup!"—*Chicago News.*

A Good Resolution



for the New Year will be to handle

New Model Grand Ranges.

They make many friends and earn good profits.

BARSTOW STOVE COMPANY,

BOSTON, 55 Portland St.
PROVIDENCE, R. I.
NEW YORK, Beekman and Water Sts.

A HAPPY and PROSPEROUS NEW YEAR

is again offered to our friends on the occasion of our

93rd Annual Greeting.

N. & G. TAYLOR CO.,

Manufacturers of Tin Plate,

Established 1810. PHILADELPHIA.

TO LIGHT A BANK

or any large room, use my cluster reflectors, made in a great variety of styles and sizes. There are none more powerful or better.

I. P. FRINK, 551 Pearl St., New York.

L. & R. WISTER & CO.,

Builitt Building, Philadelphia.

Dunbar Foundry Pig Iron.
Dunbar Connellsville Coke for Foundry Use.
American Sheet Iron Co.'s Sheet Iron.
American R. G., cleaned, of uniform black color.
Dealers in all kinds of Iron and Steel Scrap.

BRUCE & COOK.

TINNERS' TOOLS and MACHINES.

TINNERS' SUPPLIES.

186, 188 & 190 Water Street, and 248 & 250 Pearl Street, NEW YORK.



Ideal Sap Spout

Are made open or closed, and a full line of other Maple Sugar goods. Send for dealers' price list.

CHARLES MILLAR & SON CO, Utica, N. Y.

Oven Capacity

is one of the principal requirements in a modern range. This is increased 50 per cent. in the

MODEL HUB

With Steel Oven

by baking on oven bottom and oven rack at same time.

NO CHANGING OF FOOD NECESSARY.

SMITH & ANTHONY CO., Boston.

Your Future

business success can be measured by the wise or unwise choice of the goods you sell to-day. Hundreds of successful stove merchants sell Glenwood Ranges and Heaters because they always satisfy and invariably make lasting friends.

GLENWOOD

Write the Weir Stove Co., Taunton, Mass.

HEATER PIPE TIN.

We can make prompt shipment of the following sizes:

I C.	I X.
20 x 23	20 x 23
20 x 26	20 x 26
20 x 29½	20 x 29½
20 x 32½	20 x 32½
20 x 36	20 x 36
	20 x 39

We solicit your orders.

McCLURE & CO.

Manufacturers of Tin Plate,

PITTSBURG, PA. 211, 213 and 215 Second Ave.

PHILADELPHIA, PA. 115 North 7th Street.

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Index to Advertisements, Pages 57 - 59.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. LVII. NUMBER 2. | NEW YORK AND CHICAGO, JANUARY 11, 1902. | ONE DOLLAR A YEAR. SINGLE COPIES 5 CENTS.

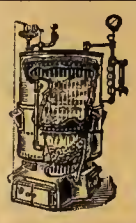
WALWORTH MFG CO. TOOLS and SUPPLIES for STEAM WATER and GAS USERS BOSTON MASS

WALWORTH HEAVY PIPE VISE.



A first-class Tool for General Machine Work. Takes to 6-inch.

BOSTON, 128 Federal Street.
NEW YORK, Park Row Building.



The Gorton Side Feed Boilers

FOR STEAM AND HOT WATER HEATING.

INVESTIGATE FOR YOURSELF.

Send for Catalogue and Prices.

GORTON & LIDGERWOOD CO.,

96 Liberty St., NEW YORK. Old Colony Bldg., CHICAGO.
77 Oliver St., BOSTON. Prudential Bldg., ATLANTA, GA.



STOVE LININGS McLEOD & HENRY CO., TROY, N. Y.

Diamond Thimbles. S. CHENEY & SON, Manlius, N. Y.

Don't forget the six points of excellence about the Excelsior Range. 1.—Eclipse Center Lift Covers. 2.—Sheet Flue. 3.—Ventilated Oven. 4.—Complete Control of the Fire. 5.—Plenty of Hot Water. 6.—Perfect Adaptability. Add to these the fact that it is sold at a fair price and you have a combination that is hard to beat. The dealer who handles Excelsior Ranges need never turn a customer away.

ISAAC A. SHEPPARD & CO.

NEW YORK PHILADELPHIA BALTIMORE

Some say Apollo is one of the best of galvanized irons; no, thank you; it is the only uniform soft and flat one.

American Sheet Steel Company
New York

WHAT MAKES

The Stewart Oak

So popular among the dealers? Because it is a lively seller and brings good profit. It stays sold and nobody kicks at it except the coal man?

FULLER & WARREN CO., Troy, N. Y.

This Ad changes every week.

NOTICE.

Silver, Nickel Platers and Brass Goods Mfrs. MATERIAL FOR DRYING PURPOSES.

Write for prices to John Sommer's Son, 355-365 Central Ave., Newark, N. J.



CROSBY SPRING-SEAT

GLOBE and ANGLE VALVES, IRON and BRASS.

All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.

Crosby Steam Gage & Valve Co.,

BOSTON: 95 Oliver St. NEW YORK: 78 John St. CHICAGO: 21 23 W. Lake St.



Steam Specialties.

RELIEF and ELEVATOR VALVES, STEAM TRAPS, STEAM AND WATER REDUCING VALVES, TANK TEMPERATURE CONTROLLER and A No. 1 DAMPER REGULATORS

NOISELESS BACK PRESSURE VALVES, PUMP GOVERNORS, STEAM and OIL SEPARATORS.

KIRLEY AND MUELLER,
9-17 W. 13th St., - NEW YORK.



Jenkins Bros.' Valves

are manufactured of the best steam metal, and are fully guaranteed. Why experiment with cheap valves? If you want the *BEST* ask your dealer for valves manufactured by Jenkins Brothers. Remember all genuine are stamped with Trade Mark like cut.

JENKINS BROTHERS, New York, Philadelphia, Chicago, Boston.

FOLLANSBEE BROTHERS CO.,
328-330-332 Second Ave.,
Pittsburgh.
Galvanized and Black Sheets.

The past year broke the record Our sales in 1901 were largest ever known for "SCOTT'S EXTRA COATED" the best American Roofing Tin. "FOLLANSBEE PURE IRON OLD STYLE" is genuine Iron Base.

Philadelphia, 133 Arch St.
Chicago, 504 N. Water St.
Louisville, 7th and Magnolia.

Magee RANGES & HEATERS

Handle goods that the consumer knows and has confidence in,—that's one of the secrets of success

MAGEE FURNACE CO BOSTON

ROUND OAK

STANDARD of AMERICA

If it were possible, by spending more money, to Make a better steel range than the

Round Oak

we would do it.



As it is, we take every pains to build it right. We grind every door and draft to fit tight. We use three thicknesses of heavy asbestos board to insulate the oven, and we put it all around the oven flues—not only where it will show. It will hold fire; It will save fuel; and we expect it to outwear and outlast any range made.

It is a business getter and a business builder—good goods always are. These are facts for you to consider.

Estate of P. D. BECKWITH

Makers of Good Goods Only DOWAGIAC, MICH.

HB CHICAGO

It is far easier to effect a single sale than to gain a permanent customer. Glue them to you—make them stick—sell good goods—CARTON FURNACES, for instance.

CARTON "F"

WARM AIR FURNACE



There are many "talking points" about this heater.

One thing may be emphasized strongly:

No furnace in the market presents more efficient fire surface.

Look at the gas dome—a one-piece casting—no chance for an argument here.

MODERATE IN PRICE.

THOROUGHLY EFFICIENT.

International Heater Co.,

UTICA, N. Y.

BOSTON. NEW YORK. CHICAGO. DENVER.

The Largest Makers of Heaters in the World.

RELIABLE

Vapor Stoves and Ranges.



We have added several new patterns of Vapor Stoves and Ranges to our already large line for 1902, and in the future, as in the past, they will be beyond the reach of all competition. Dealers who handle the **RELIABLE** line invariably control the vapor stove business of their city. They never disappoint the user. Each stove sold will sell another! Testimonials of dealers who have handled them bear witness to their profit-making qualities.

Dealers should write us for a copy of our 1902 Vapor Stove Catalogue. Free for the asking.

THE SCHNEIDER & TRENKAMP CO.

CLEVELAND CHICAGO SAN FRANCISCO



1802 — 1902

..Note.. the Difference.

There is relatively just as much difference between the

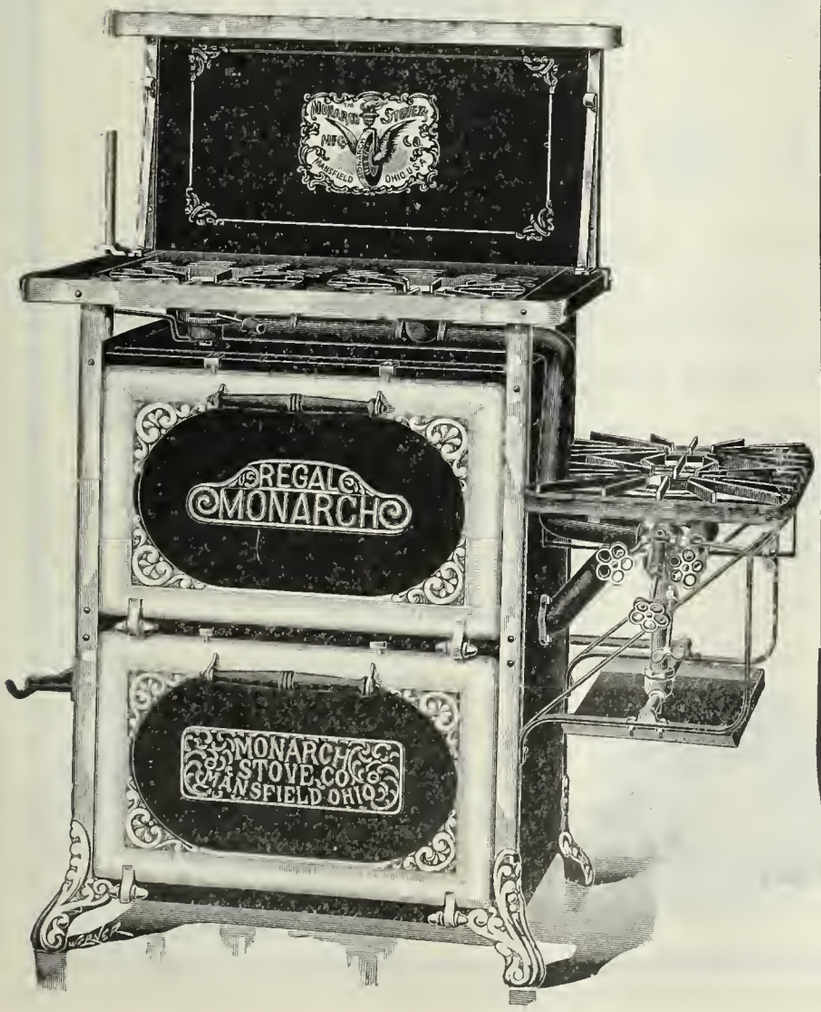
MONARCH LINE

and other makes.

Our line to-day is first and foremost in point of Excellence, Beauty, Finish and Practicability.

DEALERS

Make no error in handling this line for 1902 of Vapor and Oil Stoves and Asbestos Lined Ovens, as they, once shown, practically sell themselves. Write now to us direct or any of our Agencies. Your communications will have prompt attention, and be sure to get a copy of our new Catalogue.



THE MONARCH STOVE & MFG. CO.,

MANSFIELD, O.

BRANCHES.

284-6 Pearl St., N. Y. 67 Lake St., Chicago.
107 N. 2d St., Phila. 191 Eagle St., St, Paul, Minn
203 Wood St., Pittsburg.

H. R. BRUCE & CO., Agents,

419 Pike Bldg., Cincinnati, O.

JEWEL STOVES AND RANGES.

JEWEL STOVES AND RANGES
DETROIT STOVE WORKS
LARGEST STOVE PLANT IN THE WORLD

A Complete, Well Advertised Line;
Low Prices and Good Workmanship.

Please Write for Catalogue.

DETROIT STOVE WORKS.

Detroit - Chicago.

STAR STOVES AND RANGES
ENTERPRISE STOVE CO. VINCENNES, IND.
GUARANTEED

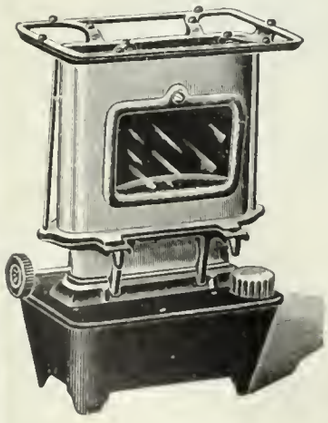
CATALOGUES SHOWING
GAS RANGES
CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS
WILL BE FURNISHED FOR THE ASKING BY

Enterprise Stove Co., VINCENNES, IND.

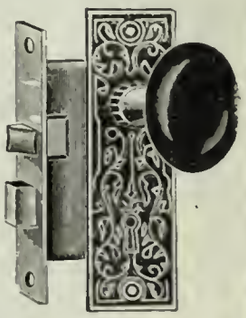
THE TAYLOR & BOGGIS FOUNDRY CO.,

MANUFACTURERS OF

LIGHT GRAY IRON CASTINGS.



Builders' Hardware,
Dampers, Oil and Gas Stoves,
Japanners and Electroplaters.



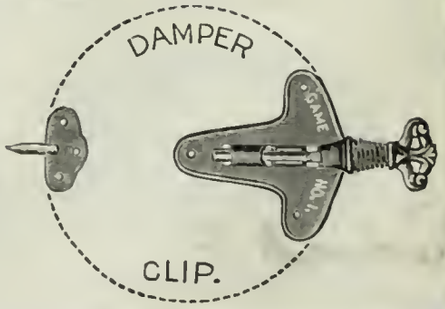
OFFICE and Foundry No. 1—521 to 541 Seneca St.
Foundry No. 2- C. & P. R. R., near Euclid Ave.
Lock Dept.—C. & P. R. R., near Euclid Ave.

CLEVELAND, O.

New York Representative, J. M. Litchfield, 105 Beekman St.
San Francisco Representative, H. A. Potter, 35 New Montgomery St.







THE GREAT
WHITE ENAMEL
LINE.



OUR CHICAGO EXHIBIT

is now ready for your critical inspection, occupying a prominent position in the new

MANUFACTURERS' EXHIBITION BUILDING,

On Michigan Avenue, between 13th and 14th streets, where we are showing a superb sample line of

BUCK'S STOVES and RANGES

In all sizes and styles.

We cordially invite you to make our Chicago Office your headquarters while you are visiting this greatest exhibition of manufacturers' products ever assembled under one roof.

We wish to express our hearty thanks for the splendid year's business just closed and ask for your future trade upon the merits of our goods and the business building power of our advertising system.

BUCK'S

STOVE & RANGE CO.,

ST. LOUIS.

J. O. SHRINER & SON,

DEALERS IN

TIN AND STEEL ROOFING,

GALVANIZED IRON WORK AND SPOUTING. JOB WORK OF ALL KINDS.

NEW CASTLE, IND., January 1, 1902.

DIGHTON FURNACE CO.,

GENTLEMEN: I was talking to the man that we put the "DIGHTON" Furnace in for in August, 1900.

He told me that it worked fine and that he is well pleased with it. Please give me prices on them at once.

Yours truly,

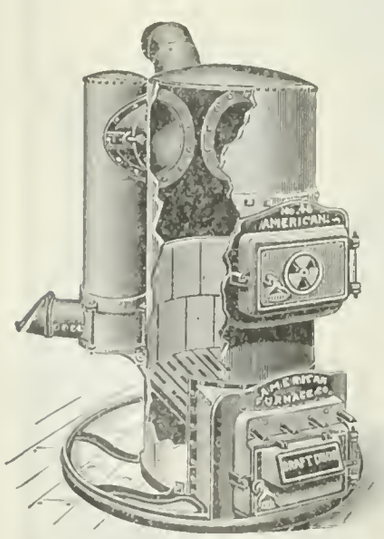
J. O. SHRINER & SON.

Your Guarantee is Good,

If backed up by our line. We make many kinds and sizes of steam and hot water boilers, and you as a dealer ought to know all about this line. Let us send you our printed matter and post you on the standard line. Write to-day.

KEWANEE BOILER COMPANY

KEWANEE, ILLS.



Burn Hard or Soft Coal, or Coke. Large Doors.

About Fire Pots.

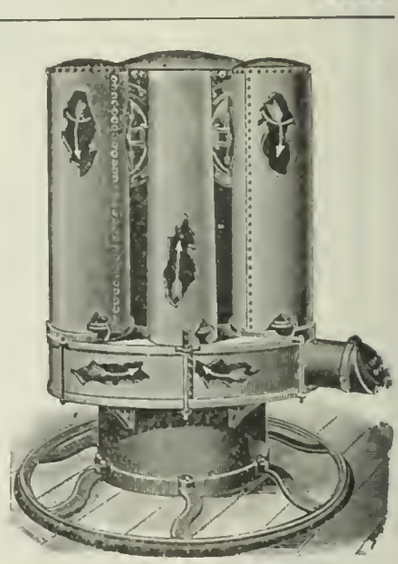
We formerly lined our fire pots with cast iron—then they cracked and warped. Now we use fire brick for lining and will guarantee it for five years. The lining is replaced through the fire door.

The **AMERICAN FURNACE** is made strong in places where other furnaces have proven weak; it is made of heavy steel and riveted tight like a boiler. Will burn any kind of fuel.

You can only build up a permanent furnace business by handling a first-class furnace. We manufacture for the better class of trade.

The American Furnace Co.,

1911-13 PINE STREET, · ST. LOUIS, MO.



Large Radiators, easy to clean out.

Write for prices and secure the agency before the other fellow gets it.

GILT EDGE FURNACES AND COMBINATION HEATERS.

Registers, and Tin and Galvanized Iron Furnace Fittings.

MANUFACTURED BY

R. J. SCHWAB & SONS CO., = Milwaukee, Wis.

THE H.B.SMITH CO.,

WESTFIELD, MASS., U.S.A.

Catalogue furnished only upon application to

Heating Contractors, Engineers and Architects

64 Pages. Size 9 x 12 Inches.

INDIRECT RADIATORS

(16 STYLES)

PACIFIC COAST AGENTS

HOLBROOK, MERRILL & STETSON,

SAN FRANCISCO, CAL.

EUROPEAN AGENTS

AUG. EGGERS,

BREMEN AND NEW YORK CITY.

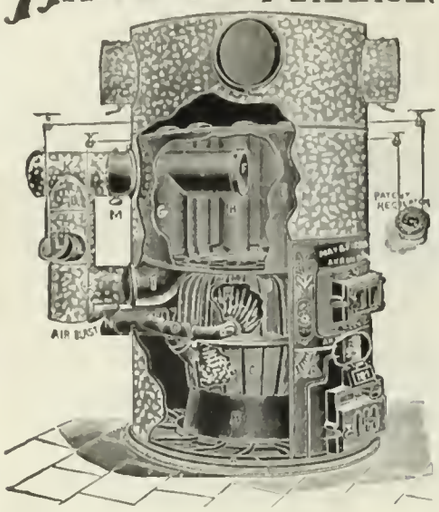
SALESROOMS:

THE H.B.SMITH CO.,

133 CENTRE STREET.,
NEW YORK.

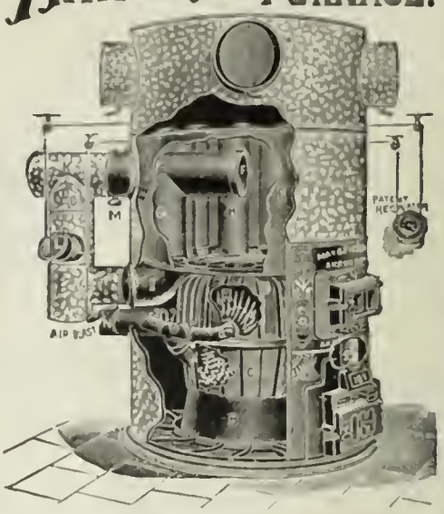
510 ARCH STREET.,
PHILADELPHIA.

AKRON AIR BLAST FURNACE.



MANUFACTURED BY MAY & FIEBEGER AKRON, OHIO.

AKRON AIR BLAST FURNACE.



MANUFACTURED BY MAY & FIEBEGER AKRON, OHIO.

TWELVE YEARS' SALES

Have demonstrated that
Dealers can use and

Architects can specify

THE AKRON AIR BLAST FURNACE

with absolute safety.

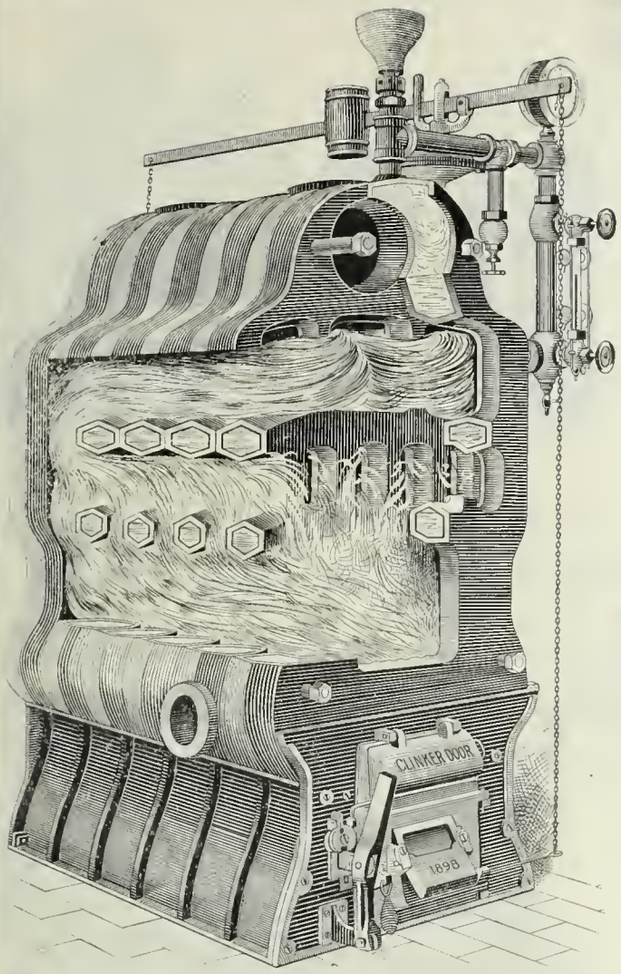
Tens of thousands in use.

OVER 1100 In Use in Akron, O.

MANUFACTURED BY

MAY & FIEBEGER,

Send for catalog. AKRON, OHIO.



IDEAL SECTIONAL STEAM BOILER.

Ideal Boilers

will be more popular than ever in 1902, and we shall be prepared to give even better service than during the past busy year.

Have you our Catalog?

AMERICAN RADIATOR COMPANY

CHICAGO.

New York, Philadelphia, Buffalo,
St. Louis, Minneapolis, Denver.

READ OUR OFFERINGS.



Special Advantages Over All Other Heaters.

OUR HEATERS are only 4 ft. 3 in. high, giving excellent elevation for Hot Air Pipes.

OUR HEATERS ARE ALL CAST IRON, no repairing of sheet iron drums necessary every few years.

OUR MANIFOLD TUBES are steel, ⅛ inch thick, and will wear for a lifetime.

OUR HEATERS are supplied with the most modern grates, perfect dumping and shaking. Each bar can be separately replaced.

OUR HEATERS are so arranged that they can be perfectly cleaned by any one, and in a few moments.

Equally Efficient with Hard or Soft Coal.

Our Heaters save the heat others waste up the chimney and send it through the house, therefore reduce coal bills.

SEND FOR CATALOGUE, REFERENCES AND FULL PARTICULARS.

TUBULAR HEATING AND VENTILATING CO.

MANUFACTURERS of the FORBES WARM AIR FURNACE.

232 Quarry St., PHILADELPHIA, PA.

TO

FURNACE DEALERS

FOR 1902 We have a large line of **HOT AIR FURNACES** in styles and sizes which we will sell at reasonable prices. No order is too large or too small for us, and we are after business from any portion of the United States, no matter how near or far, and can name delivered price at any railroad station.

WE WILL SELL one furnace or we will sell one or more carloads and the buyer in every case is accorded thorough satisfaction and courteous treatment. WE GIVE EXCLUSIVE TERRITORY.

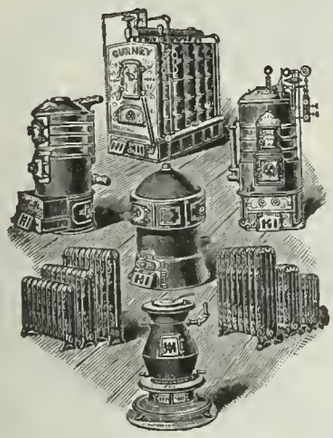
Dealers who have done unprofitable business in the past are requested to write us and we will show them how they can change their loss to profit, and make selling **FURNACES** a profitable and pleasant occupation.

OUR CATALOGUE is an educator and in the interest of Good Furnace Work we want every dealer to have it, whether he sells our furnaces or some other furnace.

WRITE NOW for the exclusive Agency for **1902.**

GIBLIN & CO.,

UTICA, N. Y.



Even members of the same family are not always alike in virtue or ability, yet the

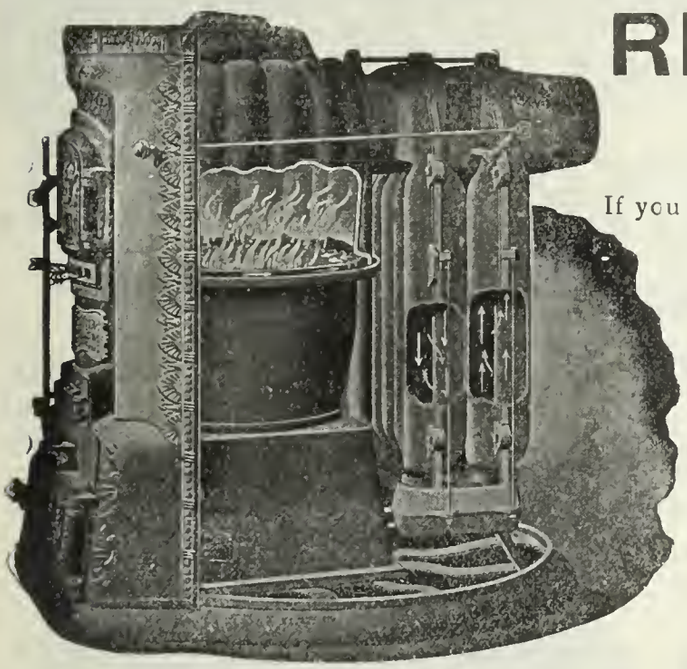
Gurney Heaters

Are of uniform excellence. In all of them the heating surfaces are so arranged as to produce a maximum of heat from a minimum amount of coal.

All are made from the best grades of iron, have the most efficient types of grates, and embody all the latest improvements. "Bright Idea," "Doric," and "400 Series" Steam and Hot Water Heaters are thus equipped. Sales of any of them will enhance your reputation. Would you become an agent? Let us hear from you.

GURNEY HEATER MFG. CO., 74 Franklin Street, Boston.
111 Fifth Ave., New York City.

Western Selling Agents, JAMES B. CLOW & SONS, 222-224 Lake St., Chicago, Ills.



RESOLUTIONS ARE IN ORDER.

If you have not already done so resolve at once to handle during the year the leading heater on the market,

THE BENGAL . . . . HOT AIR FURNACE.

HAS MORE GOOD POINTS THAN WE HAVE ROOM TO TELL YOU HERE.

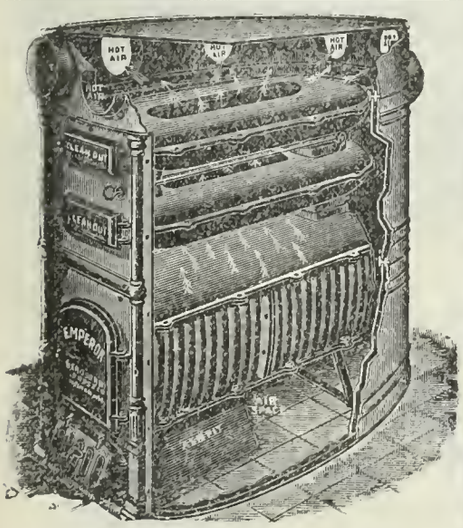
BENGALS HEAT THE HOUSE—NOT THE CHIMNEY.

WRITE FOR OUR CATALOGUE.

SECURE A BENGAL AGENCY AT ONCE.

Eastern Selling Agents,
GURNEY & CO.,
Washington, Hanover and Elm Sts., BOSTON, MASS.

FLOYD, WELLS & CO., - Royersford, Pa.



Emperor Furnaces
FOR WOOD.

Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces, . . .
Furnished for either Brick or Galvanized Iron Casing

SEND FOR CATALOGUE.

Bergstrom Bros Co.

NEENAH, WIS.

BRAND STOVE CO.

STOVES, RANGES and FURNACES.

SEND FOR CATALOG.

MILWAUKEE, WIS.

Royal Heaters.

MANUFACTURED BY THE

HART & CROUSE Co.

UTICA, N.Y.

ALL THE LEADING LINES OF

STEAM, HOT WATER & HOT AIR,

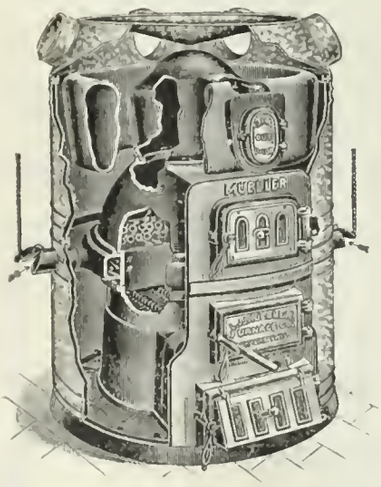
FOR HEATING ALL CLASSES OF BUILDING.

235 WATER ST., N.Y.
COLUMBUS, O.

BRANCHES.

79 LAKE ST., CHICAGO.
ST. LOUIS.

WITH AIR BLAST ATTACHMENT.



Is Your Heating Business Profitable?

IF NOT

MUELLER

Furnaces and Boilers

WILL MAKE IT SO.

COMPLETE LINE OF HEATERS, FOR ALL KINDS OF FUEL.

Get Our Special Register Offer.

EVERYTHING IN THE HEATING LINE.

FOR WOOD.



L. J. MUELLER FURNACE CO., 190 Reed St., Milwaukee, Wis.



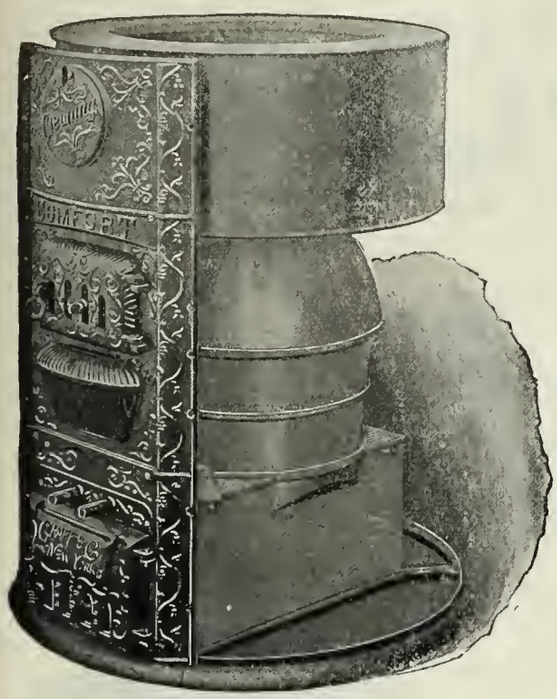
WINCHESTER

In speaking of the "WINCHESTER" Heater, one is inclined to work the superlative degree to the limit. Certain it is that no words of praise are too strong. It was built to make heat, and it makes it. The agency is valuable. Manufactured by Smith & Thayer Company, Boston, Mass.



HEATER.

A Source of Comfort



during the cold blasts of winter can be found in a good furnace. Not only does the **user** enjoy it, but the **dealer** derives great satisfaction as well as profit from it.

Good Furnaces are to be found at **reasonable** prices if you look in the right place.

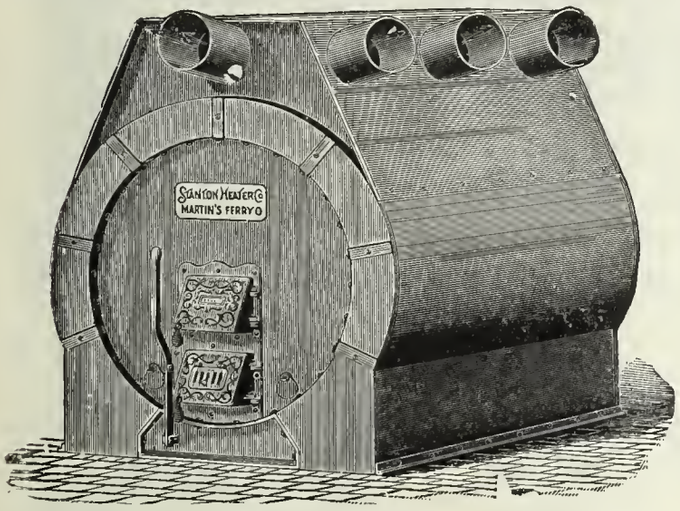
This advertisement is intended as a **guide** to point you to **the** right place. If you would be convinced try it **and see.**

Faultless Furnaces.
Hero do.
Comfort do.
Rival do.

The Graff Furnace Co.,

208 WATER ST., NEW YORK.

The Stanton Seamless Heater,



PORTABLE CASED.

WEST LIBERTY, IA., June 22 1900.

THE STANTON HEATER CO.,
Martin's Ferry, Ohio.

Gentlemen:—I had a Stanton Seamless Heater put in my house last year and it gives perfect satisfaction. Have no trouble in keeping the whole house comfortable in the coldest weather.

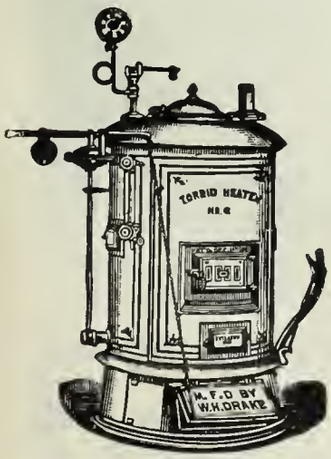
Anyone wishing a Furnace will not make a mistake in buying a Stanton Seamless Heater.

Yours truly, DR. L. W. STRUBLE.

SEND FOR CATALOGUE.

THE STANTON HEATER CO.,
Martin's Ferry, Ohio.
See Our Advertisement Next Week.

"TORRID HEATER."
FOR STEAM OR HOT WATER.



It is Practical in Design.
It is Safe, Being Tested to 200 Pounds.
It is Easy to Manage and Keep Clean.
It is Durable.
It is Sectional and Easily Handled.
It has No Packed Joints.
It is Self-Feed or Surface Burning.
It has the Torrid Patent Rocking and Dumping Grate.
It is Low in Price.

SEND FOR CATALOGUE.

MANUFACTURED BY

W. H. DRAKE, No. 36 Clinton St. NEWARK, N. J

Factory: Hackettstown, N. J.

Registers and Ventilators



Send for Prices.

Seavey Mfg. Co., : : BOSTON, MASS.

They regulate heat in residences, offices, stores, mfg. plants. Guaranteed.

...Wanted...

Mechanics familiar with the installation of house heating furnaces or boilers to sell and put up

No electricity or compressed air. Simple as a heavy spring motor can be.

SPRAGUE *AUTOMATIC* *DAMPER and VALVE* REGULATORS

Must be of good address and have ability as salesmen. Salary $15 per week and expenses. References required.

WRITE THE MANUFRS.,

They Are "Coal Savers."

HOWARD THERMOSTAT CO., Oswego, N.Y.

WEST WATER STREET

Money Makers for Dealers.

Gurney

HOT WATER GENERATORS
HOT AIR GENERATORS
STEAM GENERATORS
RANGES *and* STOVES
REFRIGERATORS
STEEL RANGES
GAS RANGES
FURNACES

GURNEY AND COMPANY

WASHINGTON, HANOVER AND ELM STREETS

BOSTON, - MASSACHUSETTS



AS GOOD AS GOLD IS A

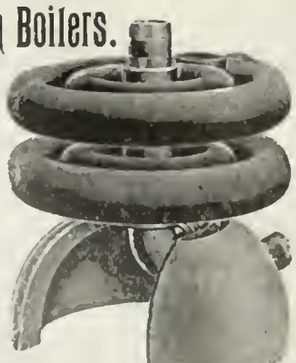
RICHMOND HEATER.

IT CUTS YOUR COAL BILL IN TWO.
IT WARMS YOUR HOUSE FROM CELLAR TO GARRET, AND ALMOST TAKES CARE OF ITSELF.

Write for Catalogue.

The Richmond Stove Co.
NORWICH, CONN.

The Champion Hot Water Combination Boilers.



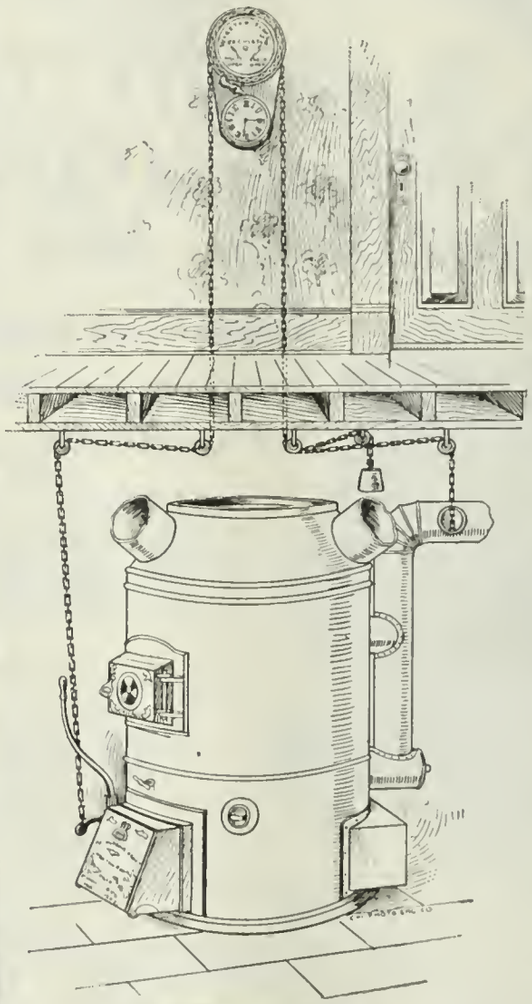
THEY FIT ANY FURNACE.

These Boilers are made in three sizes diameter, and from 100 to 600 square feet radiation capacity

Will heat those cold rooms, or an addition to the building. Will increase the capacity of any furnace. Are cheaper than coils and will do more work.

Write for new circular. Manufactured by

FRANK D. STOLZ,
115 Lake St., - - Chicago, Ill.



An Enthusiastic Customer is a Great Business Getter.

The Wireton Time Regulator

Not only starts your customer's fire while he sleeps, but also starts him talking about your *up-to-date methods.* The only novelty this year in the heating trade. A great fuel saver. Insures a warm house in the morning by *automatically* turning on the draft at an early hour.

Combines a Time Draft, Draft Regulator, and an Alarm Clock all in one.

Retail price $5.00 for Time Regulator and Clock complete.

Exclusive Territory given. Get in line *quick.*

Prices, Terms and Catalogue furnished upon application to the

Wireton Heating Co.,

Manufacturers of

Quaker, Panama, Hoffman and Farquhar Furnaces, Pipe, Fittings and Furnace Supplies,

Blue Island, Illinois. Chicago Office, 40 Dearborn St.

I have had your Time Regulator in use for about two months. I would not take $25.00 for it if I could not get another like it.
Dec. 5, 1901. J. A. BENSON, Kirkland, Ill.

Your Time Regulator has been in use for the past two months, and during that time has never failed to work. I consider it a purchase which has filled a long felt want. Think no furnace should be without one.
A. S. ROGERS,
Dec. 12, 1901. 6610 Normal Ave., Chicago.

The writer attached your Draft Regulator, and up until the present time its operation has been entirely satisfactory.
J. W. CONCHAR,
Of Schrieber & Conchar Mfg. Co.,
Dec. 9, 1901. Dubuque, Iowa.

Your Time Draft Regulator is absolutely reliable. It opens the draft at any desired hour without fail. It is a great comfort and I would not try to get along without it.
P. S. HUDSON,
Dec. 9, 1901. 6618 Normal Ave., Chicago.

Look out for New Quaker Furnace adv. in next issue.



Brien Heater.

A perfect, all cast WOOD or COAL burner. There is no other Hot Air Furnace as low down as the "BRIEN."

Write for territory, catalog and prices.

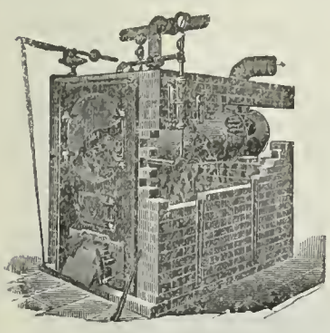
BRIEN HEATER CO.,
HOOSICK FALLS, N. Y.

STAMFORD FOUNDRY COMPANY

MAKERS OF

RANGES COOKING AND HEATING STOVES
HOT-AIR AND COMBINATION AIR AND
WATER FURNACES
LAUNDRY STOVES CONFECTIONERS' STOVES
CABOOSE RANGES ETC ETC

STAMFORD CONN



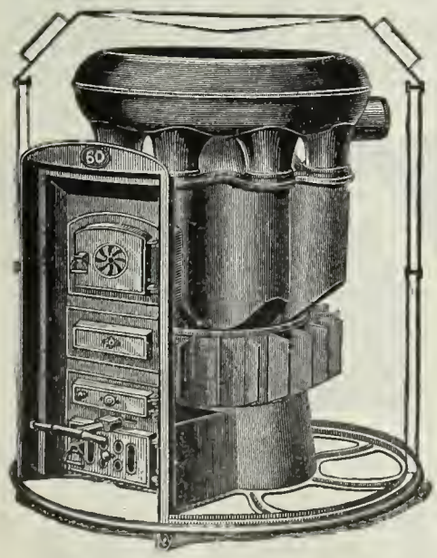
Vance Boilers.

The most economical Steam and Hot Water Boiler on the market. Write for Catalogue and Price List.

VANCE BOILER WORKS,
373 Atkinson St., Geneva, N. Y.



CABINET
PORTABLE OVEN.
OUR LATEST PRODUCTION.
BAKES EVENLY BY THE CIRCULATION OF HOT AIR.
FOR BAKERS, CONFECTIONERS, HOTELS,
Also the best oven for Core Baking, Japanning, Enamelling, etc.
Made in six sizes, single and double, for coal, wood, natural or artificial gas.
SEND FOR CATALOGUE.
The G. S. BLODGETT CO., Burlington, Vt., U. S. A.



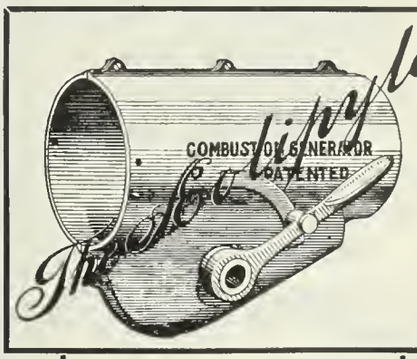
Imitation is Flattery.
Cory's All Cast FURNACES
HAVE BEEN COPIED
BUT NEVER EXCELLED.
An Absolutely Gas Tight Furnace
Without Bolted Joints.
UZAL CORY & CO.,
210 WATER ST., NEW YORK.
Established 1847.

MICA
EUGENE MUNSELL & CO
MINERS & IMPORTERS
NEW YORK. 218 WATER ST. CHICAGO 117 & 119 LAKE ST.

HOT WATER AND HOT AIR



HEATING BY COMBINATION STOVES AND FURNACES.
Suitable for Large or Small Houses, Stores, Conservatories, Barber Shops, Hotels, etc., etc.
Heat Water Quickly.
Circulation is Positive.
No Joints Inside to Leak.
THE NATIONAL PIPE BENDING CO
160 RIVER ST., NEW HAVEN, CONN.



Saves Coal, Increases Heat,
Keeps Temperature Even,
Prevents Escape of Coal Gas,
Reduces Labor,
Avoids Sifting Ashes,
When Applied for Domestic Use to Smoke Pipe of
House Furnace,
Hot Water Heater,
Low Pressure Boiler,
Stove or Range.

Æolipyle Company,
237 Water St., New York,
Tel. 1849, John. U. S. A.

SCRANTON CORUNDUM & EMERY WHEEL CO.
1311-1315 Capouse Avenue, SCRANTON, PA.
Write for Catalogue.
OUR "BLACK DIAMOND" artificial abrasive wheels are especially adapted for The Stove Trade
THEY ARE THE BEST.

HANDLE THE BEST.

CHAMPION STOVE CLAY

Is the only brand made of crucible materials, viz.: Imported German Fire Clay and Plumbago from Ceylon.



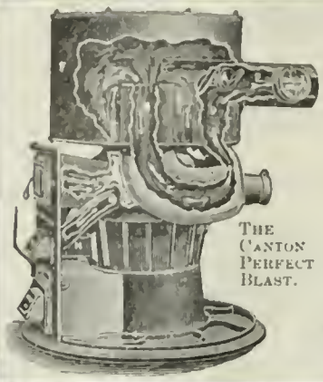
Dealers are invited to send for circulars.

Packed in neat, attractive, round pasteboard boxes of three sizes: large, medium and small, holding about 10 lbs., 6 lbs. and 2½ lbs., respectively.

ALSO SOLD IN BULK.

Your jobber can furnish the goods.

BRIDGEPORT CRUCIBLE CO.
Bridgeport, Conn.


THE CANTON PERFECT BLAST.

CANTON PERFECT BLAST AND OAK

WARM AIR FURNACES

Heavy Castings, Tubular Radiator,
Large Secondary Radiator,
A Perfect Blast,
ALL INSIDE THE CASING.

THE BONNOT COMPANY, Canton, O.



THE VICTOR INSTANTANEOUS WATER HEATER

Is the cheapest, the most efficient and the neatest Water Heater made. It occupies but little space and is always ready, furnishing hot water in a few seconds day or night

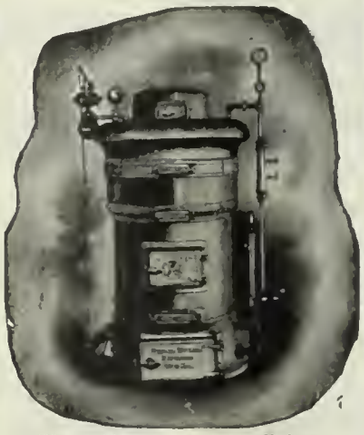
Send for Descriptive Circular, Prices, Discounts, Etc.

W. J. ADAM, - - Joliet, Ills.

Pierce

BOILERS and RADIATORS

for Steam and Water Heating

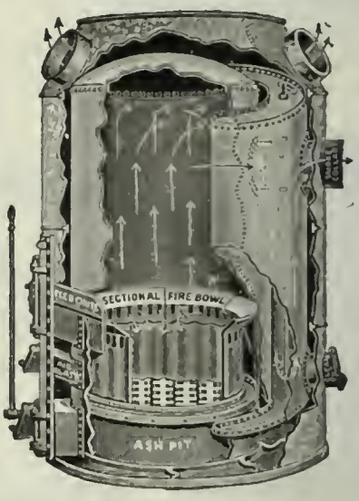

Pierce Touraine Steam Boiler.

LARGE HEATING CAPACITY.
ECONOMIC IN FUEL CONSUMPTION.

Endorsed by the foremost Architects and Heating Engineers.
Write for New Illustrated Catalogue.

Pierce, Butler & Pierce Mfg. Co.,
Syracuse, N. Y.
New York. Boston. Philadelphia.

The LENNOX



Steel Furnace.

MADE BY
THE LENNOX MACHINE COMPANY,
East Frederick St., Marshalltown, Iowa.
CATALOG FREE.

THE GEORGE W. COPE Stove Pattern Works.

ORIGINAL, ARTISTIC AND PRACTICAL CONSTRUCTION.

Cor. Randolph and Atwater Sts.,
DETROIT, : : MICH.

The Milwaukee Pattern Works.

Ornamental and Stove Patterns.

Sketches and Designs for Stove Work of all kinds.

Correspondence Solicited.

505-507 Cedar Street, MILWAUKEE, WIS.

We Protect Dealers

WHO HANDLE BURTON'S



FUEL ECONOMIZER.

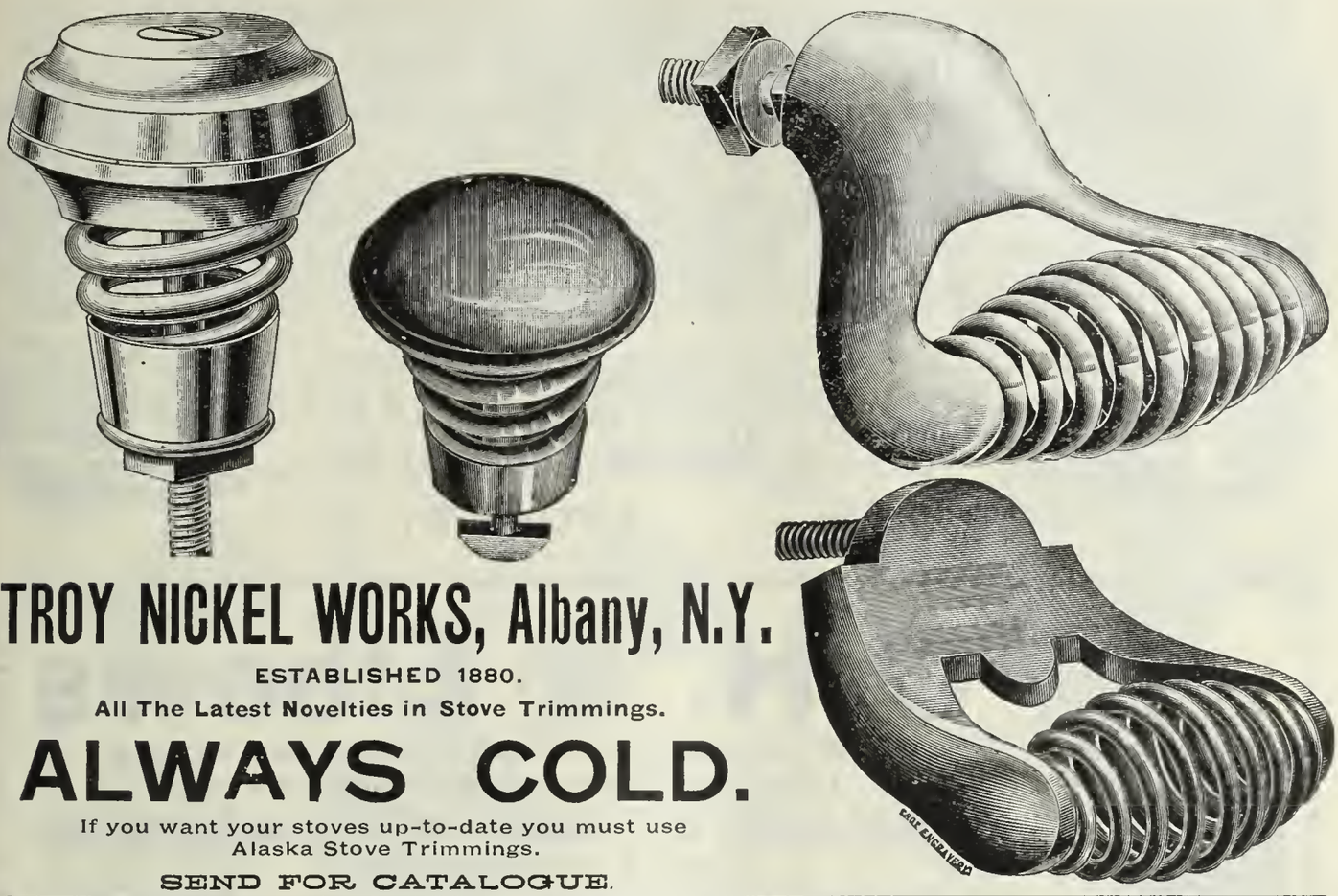
Give us a trial order.

W. J. BURTON & CO.,
164-166 W. Larned Street, Detroit.



WE don't expect you to buy Independent Registers unless it is to your advantage. But let us quote our prices.

Independent Register Co.
152 Champlain St.,
CLEVELAND, O.



TROY NICKEL WORKS, Albany, N.Y.

ESTABLISHED 1880.

All The Latest Novelties in Stove Trimmings.

ALWAYS COLD.

If you want your stoves up-to-date you must use Alaska Stove Trimmings.

SEND FOR CATALOGUE.

FIRE BRICK LININGS

For all Stoves, Ranges and Heaters.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.

M. D. VALENTINE & BRO. CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBRIDGE. N. J.

SELECTED

MICA

ONLY.

Prepared expressly for the Stove and Hardware Trade.

Two Grades: "North Carolina" and "Nevada."

PRICE LISTS AND DISCOUNTS SENT ON APPLICATION.

THE PALERMO MICA CO.,

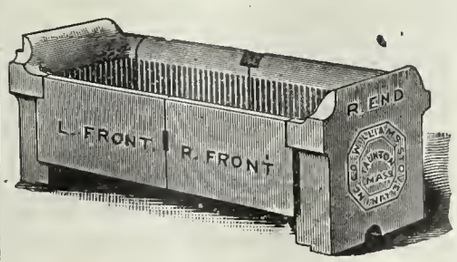
115 Beekman St., New York.

MICA

Specially Prepared for the Stove Trade.

OHIO MICA CO., CANTON, OHIO.

BRICK STOVE LININGS.



Eagle Stove Clay.

Incandescent Gas Fuel.

WILLIAMS STOVE LINING CO.,

TAUNTON, MASS.

STOVE REPAIRS.

Stove dealers' SUPPLIES of all kinds.

Water Fronts a Specialty.

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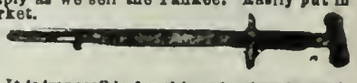


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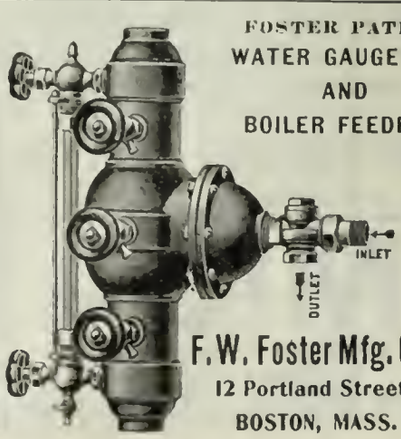
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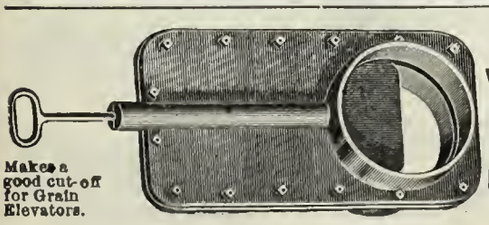
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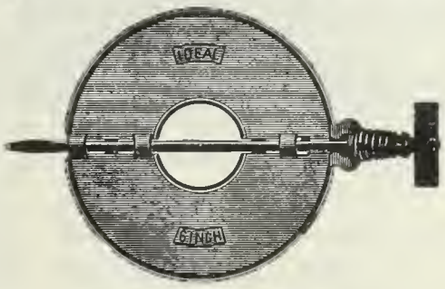
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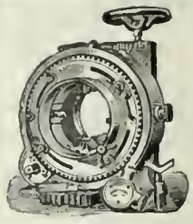
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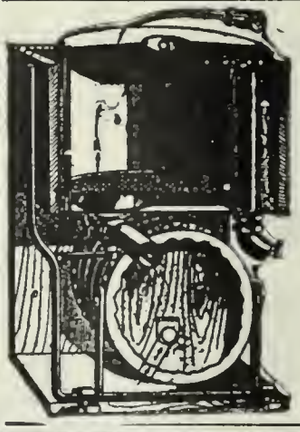
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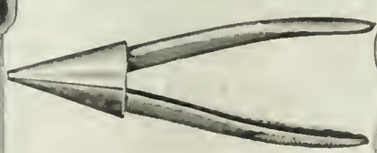
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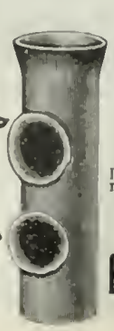
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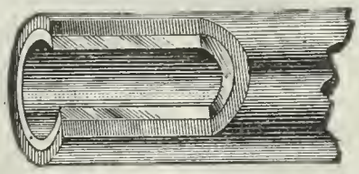
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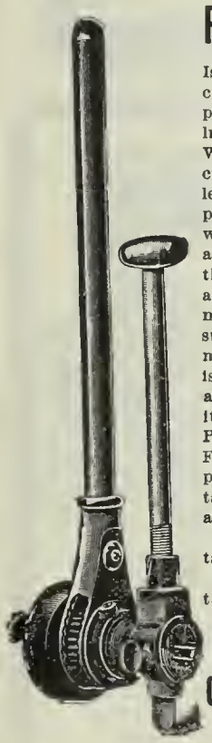


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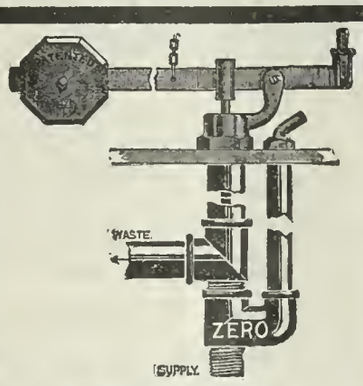
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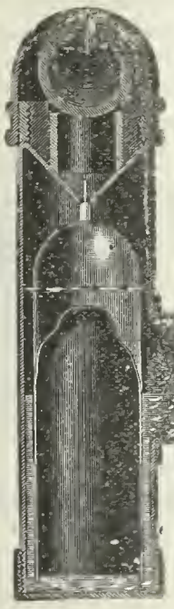
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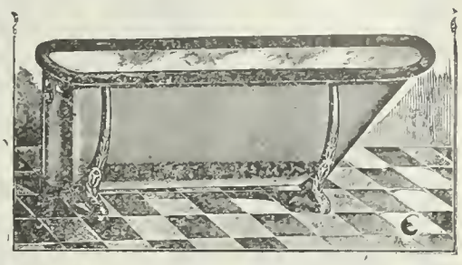
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THE METAL WORKER.

NEW YORK AND CHICAGO.

New York, January 11, 1902.

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CLEVELAND.....312 The Cuyahoga.
LONDON.....Hastings House, Norfolk St., Strand.

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Index to Reading Matter.....Page 55

The Metal Worker Index.

The Index to the reading matter of Volume LVI of *The Metal Worker* for July 1, 1901, to January 1, 1902, is now from the press, and will be mailed to those subscribers of *The Metal Worker* who will make application for it to the David Williams Company, 232-238 William street, New York City.

In order to relieve those who bind or file *The Metal Worker* of the trouble of future applications for the semi-annual Index, we have a special list to whom in the future the Index will be forwarded without further notice. Those who are now entered have had the Index mailed to them.

The Business Mortality of 1901.

The record of business failures in 1901 makes a favorable comparison with that of the preceding year. According to *Dun's Review*, 11,002 concerns suspended last year with an aggregate indebtedness of $113,092,376. These figures, while showing a slight increase in the number of failures over 1900, exhibit a gratifying decrease of nearly $25,000,000 in the aggregate of liabilities of failing concerns. The manufacturing disasters in 1901 numbered 2441, with an indebtedness of $44,960,983, compared with 2409 in the previous year, owing $51,702,142. Suspensions of traders last year were 7965 in number, with liabilities amounting to $52,060,640, as against 7844 in 1900, with liabilities of $59,415,592. Taking it all in all, the record of failures for 1901 gives that year a better showing than any previous year in the history of the country, for the defaulted liabilities were but 95 cents to each $1000 of bank exchanges, the smallest ratio noted since the record of failures was begun. Similarly, the ratio to the number of firms in business shows that the entire amount of defaulted indebtedness averaged only $94.33 for each concern, as compared with $119.63 in 1900, and, going back to 1893, with an average of $290.65. The increase in the number of insolvent concerns is by no means an evidence of unfavorable business conditions, but, on the contrary, is credited as a direct result of exceptional prosperity. A greater number of new firms were organized last year than in any previous year, owing to the larger earnings by men in salaried positions, and the better returns from small investments. Numerous new ventures of this class, backed by insufficient capital and with a deficiency of experienced management, had short lives, and in this way the number of small failures was swelled. These failures, however, had no particular influence, as many of them involved but a few hundred dollars each. A remarkable illustration of the essential stability of business conditions in 1901 is the fact that a violent upheaval was sustained in Wall Street in the early summer with practically no bankruptcies of any size, while such a series of shocks as the assassination of President McKinley, the failure of the corn crop, the serious labor troubles in the steel industry and lastly, the demoralization of the copper market, any one of which in ordinary times would have sufficed to cause disastrous complications in Wall Street, were experienced without serious effect on the general markets. In many respects the past year was one of the most remarkable in the history of the country and not the least in respect of the marvelous financial prosperity developed during its course.

Pensioning Employees.

One of the interesting announcements made at this time is that just issued by the American Steel & Wire Company. The officers of this company have taken steps to establish a pension department for the support of employees who have rendered the company long and faithful services and have attained an age or physical condition which necessitates a relief from duty. This is a particularly meritorious arrangement, as it does not contemplate the establishment of a pension fund derived from payments by employees, but will be wholly sustained by the company. It therefore differs from the system of pensioning adopted by railroad companies. It is an excellent example for other large manufacturing companies to follow. We are aware that it has long been the policy of numerous manufacturers to keep their old or incapacitated employees on their pay rolls, giving them duties suited to their age or condition, instead of turning them out to be at the mercy of the world and perhaps become objects of charity. This policy, however, is not usually carried out on a systematic plan. Therefore the action taken by the American Steel & Wire Company represents a decided improvement on what may have heretofore been done in this direction. It is an admirable idea to bring out this plan at the present time as one of the features of this era of prosperity. The liberal tendency of employers as indicated by such actions as this should go far toward establishing more friendly relations between capital and labor. If labor finds that it is remembered in times like these and given some share of the profits, the spirit of discontent, which is the prolific cause of dissension and disagreements, will be greatly allayed. It will not bring about the millennium, but will certainly have a good effect in preserving friendly relations.

The Outlook for Arbitration.

The approving attitude taken by organized labor in regard to the movement for arbitration of labor disputes initiated by the National Civic Federation at the recent convention in New York is a matter for congratulation, for it contributes one of the most hopeful factors to the industrial outlook of the country. One of the principal contentions for which organized labor has stood in recent years is the opportunity to bring its demands or grievances to the attention of the employers. This, as

President Gompers of the American Federation of Labor points out in a communication to the official organ of that body, the new movement unqualifiedly declared for and stands committed to. The conference of the Civic Federation and the establishment of its representative Arbitration Committee marked the successful issue of earnest and persistent efforts to bring about permanent arbitration of labor disputes, through the initiative of both the workers and the employers. That this movement will insure the entire elimination of strikes and lockouts from the industrial life of the country is not to be supposed, but that it will operate toward the better recognition by each side of the rights of the other cannot be doubted. The average workingman of to-day, and particularly the union worker, is of a sufficiently educated and intelligent type to recognize the truth that has been so generally lost sight of in the past—namely, that the interests of the employers and the employed are absolutely identical, and that the welfare of the one cannot be impaired without hurt to the other. Moreover, he has learned, by many sharp experiences, that strikes entail suffering and loss, even where they are, in their result, technically successful. There is no doubt that a strong feeling prevails among the workers in favor of the principle of arbitration as opposed to the crude and wasteful strike system, and that to labor as a whole, a method that will do away with the possibility of long periods of idleness and loss of income as the result of protracted labor disputes will be heartily welcome. At the same time union workers, as a class, are solidly against the system of compulsory arbitration, which some mistaken friends of labor are urging upon certain States for enactment into law. The contention is made that any system of arbitration should be one that is voluntarily accepted by both parties to the dispute, without the intervention of the courts, and that this is the only kind of arbitration that is calculated to secure permanent success.

The Fire Waste in 1901.

The years 1899 and 1900 were each marked by excessive fire losses in the United States, bringing disaster to many insurance companies and these concerns were called upon in the year just closed to suffer still heavier losses. According to the careful compilation of the New York *Journal of Commerce* the aggregate fire losses of the United States and Canada for the calendar year 1901 amounted to the enormous total of $164,347,000, or a little more than $1,000,000 in excess of the loss of 1900. Under these circumstances it is not to be wondered at that an abnormal number of fire insurance companies are reported to have retired from business last year, on account of the adverse conditions, among them being some of the older and more prominent institutions. The present outlook is said to indicate further withdrawals of insurance companies from the field during the first half of this year. The great increase in the fire waste of this country during the past three or four years is certainly alarming. Notwithstanding the improved facilities for the fighting of fire that have been introduced into our cities, the waste from this cause goes on increasing at a greater ratio than the increase of population. A comparison of the 1901 losses with those of the previous five years shows a marked increase in the damage caused by fire. For example, the average monthly loss in 1896 was $8,810,000; in 1897, $9,150,000; in 1898, $9,970,000; in 1899, $11,400,000; in 1900, $13,600,000 and in 1901, $13,700,000. The total for last year was, of course, greatly swollen by the conflagration at Jacksonville, Fla., which involved a loss of over $10,500,000, and other heavy losses were involved in the burning of the Board of Trade Building and many large stores at Montreal, Canada, and the destruction of a block of factory buildings in New York City. There were no less than eighteen separate fires during 1901 in each of which losses of over half a million dollars were incurred. Under these circumstances it is natural that the insurance companies should contemplate action in the direction of higher rates for insurance during the present year.

Growth of Small Jobbing Houses.

The great activity in trade in the past year has had important results in expanding jobbing interests at many points. This is illustrated in the growing importance of Duluth and the development of the jobbing trade in the West and Northwest generally, where many of the leading hardware and metal houses have enlarged their facilities. This is naturally the result of the existing prosperity, which causes growth in every healthy enterprise. The large establishments have not fattened, however, at the expense of the smaller ones, but the latter have likewise reaped a good share of the growth of the trade. The small jobbing houses which have been established at so many points in all parts of the country to serve the convenience of local dealers are increasing in importance, and their number is constantly being enlarged by the entrance into the wholesale field of establishments which had previously been devoted exclusively to the retail trade. This is a marked tendency of the times. It has been found profitable for the larger retail merchants to enter the ranks of the wholesale trade and employ traveling men to solicit business from smaller retailers located in their vicinity. This not only enables the house establishing a wholesale department to secure better prices from manufacturers, but it also proves a great convenience to small retail merchants, who are thus enabled to secure more prompt delivery of goods urgently needed, as they can draw them from stocks in their immediate vicinity. This feature in trade is not confined to the more remote sections, but has also developed in the cities, where the larger retail houses have found it practicable to cultivate a wholesale trade.

Editorial Notes.

The department store and the catalogue house continue to command the attention of the hardware trade, as they are a constant, and, in some sections, a troublesome form of competition. The associations of both jobbers and retailers recognize the situation, but are at a loss as to the measures to be taken to correct the evil or to check the tendency. An important event during the past year was the failure of a large Western catalogue house which had for years been a source of great annoyance both to wholesale merchants and retail dealers, as such houses cultivate a trade with consumers, thus injuring the business of retail merchants and diminishing the trade which they would otherwise have given to the jobbers constituting their regular source of supply. The manner in which this kind of competition is to be opposed, and the extent to which merchants may learn from or possibly imitate its methods, are questions which still await settlement.

Two marked developments contributed to make 1901 probably the most prosperous year in the history of California—namely, the remarkable advance in the utilization of power that once went to waste in the rivers descending from the high Sierra Nevadas and the wide introduction of native oil fuel. The mountain streams

are now being extensively used for the generation of electricity, which is carried hundreds of miles, giving power and light to the California valleys and even to cities on the coast. The cheap electric power thus obtained has so materially reduced the cost of mining and milling low grade ores that hundreds of abandoned mines were opened in the course of the year, and others greatly extended their operations. Manufacturing has also felt the stimulus of this cheap power, as well as of the cheap local oil fuel, which is rapidly superseding coal in California. These two factors, combined with the rapidly growing Oriental trade that has developed on the Pacific Coast of late years, and the general business prosperity that prevails in that section, as in other parts of the country, make the new year open very auspiciously for California.

The United States Leads.

The standing of the United States in point of national wealth as compared with her neighbors, and especially those of Europe, is illustrated by some interesting statements made in the "London Daily Mail Year Book for 1902," a copy of which has just reached the Treasury Bureau of Statistics. Under the head of "Wealth" the book places the United States at the head of the list of great nations, the figures of wealth being: United States, £16,350,000,000; United Kingdom, £11,806,000,000; France. £9,690,000,000; Germany, £8,052,000,000, and Russia £6,425,000,000. While the United States heads all of the countries in the matter of wealth, she shows the smallest national indebtedness, the figures being:

United States	£221,000,000
Germany	651,000,000
United Kingdom	706,000,000
Russia	711,000,000
France	1,239,000,000

The percentage of debt to wealth is given as:

	Per cent.
United States	1.4
United Kingdom	6.0
Germany	8.1
Russia	11.1
France	12.8

Under the head of "Fight for the Iron Trade," the publication referred to calls attention to the fact that the United States is now the world's largest producer of pig iron and steel, and says "It will be noted that the United Kingdom has lost ground, producing 396,749 tons less in 1900 than in 1899, the total for Great Britain being nearly 5,000,000 tons less than in America. An unsatisfactory feature in the British iron and steel trade is that in 1900 we imported more iron and steel than in any previous year, and exported less, while the United States exported more than ever." The tables accompanying this statement show the pig iron production of 1900 to be:

	Tons.
United States	13,789,242
United Kingdom	8,908,570
Germany	8,494,852
France	2,699,494
Russia	2,821,000

And of steel:

	Tons.
United States	10,087,322
Great Britain	4,901,054
Germany	4,799,000
France	1,624,046
Russia	1,494,000

A bill to regulate the price and quality of illuminating gas has just been introduced into the New York State Legislature by Assemblyman McCullough. This measure seeks to reduce the price of gas in New York City to 65 cents per 1000 cubic feet, the gas "to have an illuminating power of not less than 24 sperm candles—six to a pound—and burning at a rate of 120 grains of spermaceti per hour, tested at a distance of not less than 1 mile from the place of manufacture, by a burner consuming 5 cubic feet of gas per hour."

PRICES OF STOVES STIFFENING.

Recently we gave notice that an advance of 5 per cent. in the price of stoves had been made in the West. This action stimulated the stove manufacturers of Eastern Pennsylvania to profit by the example set, for at a recent meeting an advance of 5 per cent. in the price of stoves, to take effect on January 1, was made by them. So far, no evidence has reached us of a similar course being pursued by the up-State manufacturers of New York, who have held meetings frequently at the Waldorf-Astoria in New York City, nor has the apathy which seems to have seized the body of manufacturers which has hitherto met at the Astor House been shaken off to the extent of making an effort to adjust their prices in accordance with the recent increases in the cost of materials.

Notwithstanding that the year 1901 has been considered a good year in many other lines of trade, some stove manufacturers are emphatically of the opinion that the profit derived from the manufacture of stoves that have been sold in New York has been by no means satisfactory. It is also noted that the distribution of stoves in New York City and vicinity has practically gone from the old time stove dealer to the department store, the furniture dealer and the installment house, some houses stating without hesitation that 75 per cent. of the names of buyers in New York City on their ledgers are of this class. The salesmen have also begun to remark that there is a scarcity of stove dealers in New York City. Whether the contention is true that New York is the dumping ground for the surplus stove stocks from all sections of the country at whatever price can be secured, or whether the new distributers are more shrewd in their buying than the old time stove dealers, is a problem the solution of which is often discussed.

THE AMERICAN STOVE COMPANY.

We recorded in a recent issue the incorporation, under the laws of the State of New Jersey, of the American Stove Company. Since that time the capital stock of the corporation has been increased from a nominal figure to $5,000,000. A meeting of the new company was held in Chicago on Monday, January 6, when representatives of the following concerns were present:

The Ringen Stove Company, St. Louis, Mo.; George M. Clark & Co., Chicago, Ill.; the Standard Lighting Company, Cleveland, Ohio; the Dangler Stove & Mfg. Company, Cleveland, Ohio; the Schneider & Trenkamp Company, Cleveland, Ohio; the Quick Meal Stove Company, St. Louis, Mo.; the National Vapor Stove Mfg. Company, Lorain, Ohio, and the Monarch Stove & Mfg. Company, Mansfield, Ohio.

At this meeting the organization of the company was perfected by the election of 17 directors, who subsequently elected the following officers:

President, C. A. Stockstrom, St. Louis, Mo.

Vice-Presidents, George M. Clark, Chicago, Ill.; D. A. Dangler, Cleveland, Ohio; F. L. Alcott, Cleveland, Ohio.

Secretary, H. J. Trenkamp, Cleveland, Ohio.

Treasurer, George F. Fisk.

F. L. Alcott was elected as general manager of the five plants in the Cleveland district, and O. P. Moon as assistant manager at the other plants, which are located, one at Harvey, Ill., and two at St. Louis. We understand that the Harvey plant will be managed by George M. Clark, and the St. Louis plants by Louis Stockstrom.

The concerns whose names are given above practically control the manufacture of gas ranges, gasoline and oil stoves, which are made principally under United States patents owned by the new company.

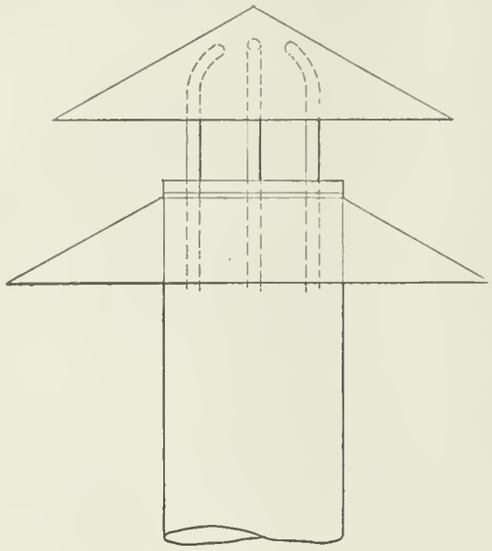
The Monarch Stove & Mfg. Company of Mansfield, Ohio, state that they have added a number of patterns to the Monarch line, including a complete line of Wickless Blue Flame Oil Stoves with student lamp construction, so that the Monarch line for 1902 will be the most complete they have ever gotten out. The company also state that their territory will be more fully covered by their salesmen than ever before in the history of the concern.

ROSINHEAD'S REASONINGS ON SMOKY FLUES, OPEN GRATES AND FIRE PLACES, &c.

BY OLD ROSINHEAD.

I am on the sick list for a few days, and as the weather is cold I have to keep in by the fire, so will take advantage of the fine opportunity to write a few lines for *The Metal Worker* on the above subject.

On a damp, dismal day, one often hears the expressions, "How heavy is the atmosphere," or "The smoke is all coming to the ground," "The air is awfully heavy" and such like observations. According to my deductions from observation I am inclined to the opinion



Rosinhead's Reasonings.—Fig. 1.—A Tested Chimney Top.

that that theory is wrong. One may say with equally as much truth that the oil is heavy when seen floating on top of water, while one thing is certain—the water is the heavier of the two.

There have been so many queries in the Letter Box about smoky chimneys of late that I thought it might not come amiss to express an opinion or two on the subject. Down drafts are produced by three several causes. A flue connecting with open fire places and grates is more susceptible to down drafts than a flue with a stove attached. A continuous smoky flue indicates that the flues in the stove, if a stove connects with it, are stopped up, or else the chimney flue has got clogged, or is improperly built. Several years ago I worked on a flue

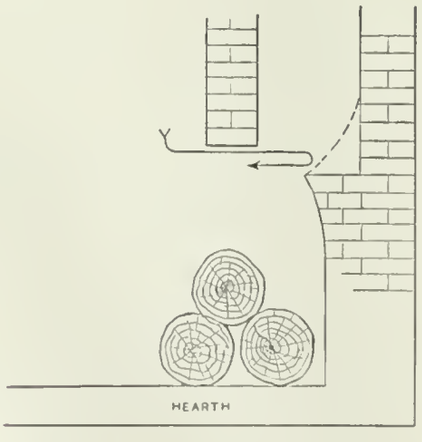


Fig. 2.—A Construction that Produces a Down Draft Effect.

that, at the point where it passed the second floor grates, had been narrowed up until the opening only contained an area of 8 square inches. I cut out the brick work and enlarged the passage to 64 square inches.

I cannot see, to save my life, why people in building houses for themselves want to put in grates. Some say they are healthy. If so, I cannot see it. When there is no fire there is always a draft of cold air coming down through the flue, and out into the room in a continuous stream. When you have a fire as fast as the heat radiates a few feet out into the room it turns back and enters the flue over the top of the fire and out in the open air it goes. I am an old bachelor and occupy rented apartments with a grate, and am writing this with my feet up into the fire. I have manufactured myself an anti-friction, ball bearing paper pin wheel, such as children play with in the streets, and have suspended it

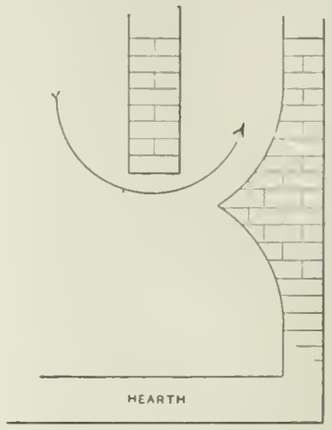


Fig. 3.—A Better Construction.

on a wire in front of the top part of my grate. It is now making an average of about 100 revolutions a minute, and when I open the doors instantly it speeds up to 500 revolutions. Very healthy to sit before a hot fire and have shafts of cold air, like Roentgen rays, pierce you through the back and then escape with some of the heat from your body into the flue over the top of the fire, and with the aid of the fire's heat, climb out to the top of the chimney. Very healthy indeed. I expect, with such treatment, I will not require a doctor at all.

The principal causes of down drafts, puffs, &c., are trees and walls of adjoining buildings projecting to a higher altitude than the top of the flue. The remedy is either to extend the flue, with brick or otherwise, above

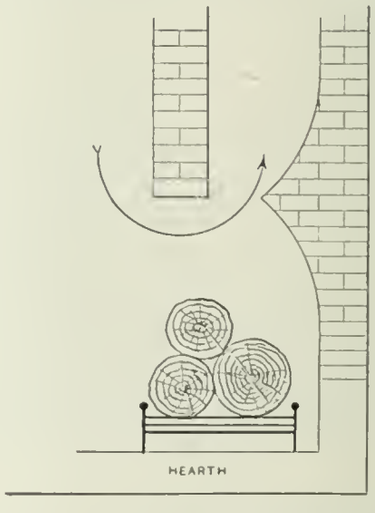


Fig. 4.—The Correct Construction.

all adjacent surrounding obstructions, or put on a ventilator cap of some kind or other. The common cap, with one plain windguard, wider than the cap itself, as shown in Fig. 1, surpasses anything extant. I have placed such on flues, right up against walls that projected three stories above, and have had no trouble afterward. The course of the arrows indicates how the currents slide away from the opening.

Some grate flues are supposed to have a down draft when they have not, and Fig. 2 shows how this can be. I have remedied this defect, as shown by the dotted line, by slipping a heavy curved piece of sheet iron in on the shelf behind, and on the top of the grate back. The construction, shown in Fig. 3, is better, but I believe that shown in Fig. 4 is best, although it is not apt to radiate as much heat. The throat should be narrow in order not to admit more air than the flue can carry up. The gases dodge around the point of the throat rapidly, but after they are past they move more sluggishly. Yet there is

no danger of their coming back, as the gases immediately behind push them on. Openings into the flue should not be narrowed up, as shown by the dotted line, but by the slanting solid lines in Fig. 5.

The great trouble with grates and fire places is that the opening permits so much air other than that which is required for combustion of the fuel, to crowd itself into the flue, that the space required to carry off the gases is limited to less than that which is required for the purpose unless the construction makes it easier for the gas to escape than for the air to rush in. This is the

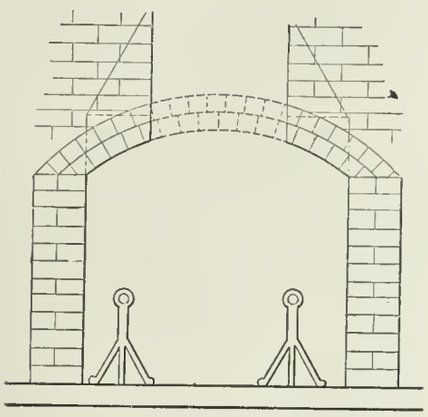


Fig. 5.—Connection of Fire Place Flue.

warm air of the room, which is needed for comfort, and its escape to the end of ventilation is what some people call "healthy."

Phillips & Buttorff Mfg. Company.

The Phillips & Buttorff Mfg. Company of Nashville, Tenn., have issued from the press what is known as Catalogue No. 120, relating to the leading lines of stoves, ranges and heaters which they are prepared to furnish. Within the covers of the work are shown a number of new designs, which have been brought out to meet well defined requirements of the trade. Among the opening pages attention is given to the National steel range, embodying the modern improvements, and offered in a variety of sizes, some of which are provided with double and triple ovens. Among the cast goods are various lines of cook stoves and ranges, while the heaters are represented with the Centennial soft coal parlor heater in the leading place. An extensive assortment of cheaper goods, including cottage parlor, Franklin, globe, cannon, air tight, box and laundry stoves are also presented. Miscellaneous goods and a comprehensive index complete the catalogue. The company state that they issue a number of departmental catalogues covering various classes of goods which they manufacture in extensive variety.

Accompanying the catalogue is a little pamphlet of a size convenient to carry in the pocket, and devoted largely to recipes for the household. These have been compiled by Mrs. Helen Armstrong of Chicago, and were used by her in connection with lectures on culinary art, the demonstrations being made on the company's National steel range. As might naturally be supposed under the circumstances, incidental reference is given to the range mentioned.

The Littlefield Stove Company, Albany, N. Y., have distributed a circular, intimating that a person cannot buy a Stove wisely until he has read the company's catalogue of West Shore Ranges, which are manufactured in great variety and adapted to meet extensive requirements. The point is made that the writer of the 48-page catalogue knows a great deal about Ranges, and the matter is presented in such shape as to cover the essential points about which both dealer and consumer should be well informed. In connection with the numerous illustrations are to be found prices for the various sizes. The company are also sending out under the title "Words of Wisdom" a 32-page pamphlet, which is made up, for the most part, of recipes for the household. A few pages are devoted to the West Shore Range, which is shown in several varieties.

TRAVELING STOVE SALESMEN FOR 1902.

We present below a list of the traveling salesmen for the current year of some of the stove manufacturing concerns of the country:

MONARCH STOVE & MFG. COMPANY

of Mansfield, Ohio, will be represented by C. E. Bartenbach and George N. Martin, who will travel in Ohio; N. S. Joslin in Indiana and Eastern Illinois, D. W. Burns in Michigan and M. F. Stellwagen in Wisconsin. Bartlett & Norris of Lincoln will look after the company's interests in Nebraska, Northern Kansas and the Black Hills; the Newby Stove Repair Company of Kansas City, Mo., in Southern Kansas and Oklahoma; the Kellogg & Stokes Company of Denver in Colorado and Utah; W. B. Gruenhagen of St. Anthony Park, Minn., will cover that State, North Dakota and Montana, and Gurney & Co. of Boston will supply the demands of the New England trade.

New York State, Northern New Jersey and Western Connecticut will be supplied by the company's New York branch house at 284 to 286 Pearl street, A. L. Canfield, manager. Eastern Pennsylvania, Southern New Jersey and the South Atlantic States will be supplied from their Philadelphia branch at 107 North Second street, A. H. McAdams, manager. Eastern Pennsylvania will be supplied from their Pittsburgh branch, 203 Wood street, R. E. Edmonds, manager; and Southern Ohio, Southern Indiana, Kentucky and Tennessee will be covered by the company's agents, H. R. Bruce & Co., 419 Pike Building, Cincinnati, Ohio.

THE ROUND OAK STOVE WORKS

of Dowagiac, Mich., have arranged for the following traveling salesmen to represent them in the territory mentioned: A. E. Rudolphi in New York and the New England States, John A. Howard in Ohio, W. T. Leckie in Michigan and Indiana, Robert R. Elliott in Illinois, George T. Adams in Wisconsin, Minnesota and the Dakotas, John L. Parker in Iowa, Claude L. Hayden in Missouri, Colorado and the Pacific Coast and Fred. D. Stebbins in Nebraska, Kansas and Oklahoma.

GEORGE M. CLARK & CO.

of Chicago will be represented as follows during the coming year: Fred. K. Wells in the Eastern Coast States, W. G. Vought in New England and New York City, S. W. Lucas in Pennsylvania, Eastern Ohio and Wisconsin, C. T. Mason in Western Ohio and Indiana, Geo. E. Harris in Michigan, John C. Buckley in Illinois and Missouri, C. H. Macbeth in Iowa, J. H. Batchelder in Chicago and vicinity, Axel Gutsch in Pacific Coast and H. W. Peak in Texas.

THE ECLIPSE STOVE COMPANY

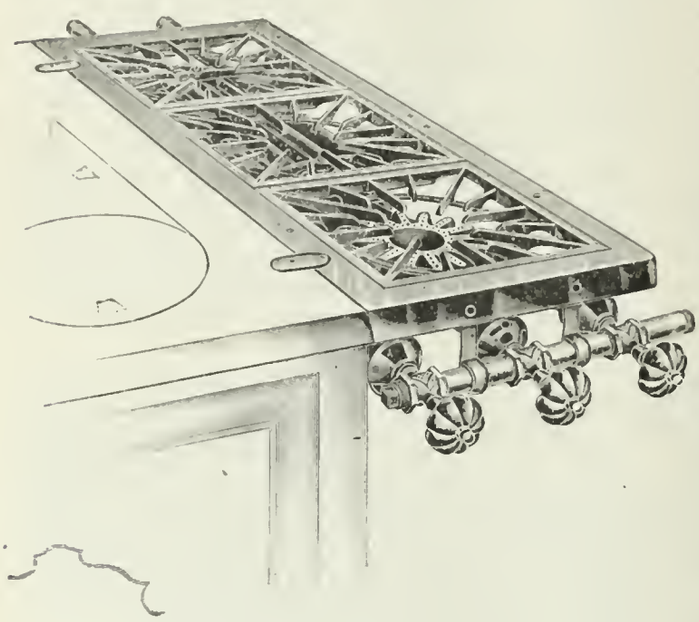
of Mansfield, Ohio, have selected the following salesmen to cover the territory named during the year 1902: H. D. Bell in Illinois and the city of St. Louis, J. C. Bump in Wisconsin and the Peninsula of Michigan, V. S. Hostetter in Indiana, C. A. Munsell in Ohio, E. H. Fay in Michigan, W. L. Dobson in Maryland, Delaware, Virginia, West Virginia, Southern Pennsylvania and other Eastter territory and J. A. Pinkerton in Iowa.

The company's Northeastern office and repository at St. Anthony Park, Minn., will continue under the management of W. H. Gruenhagen, and their Omaha branch and repository for supplying the trade in Nebraska, Western Iowa and South Dakota will also be continued during 1902.

The members of the office force of the Joliet Stove Works, Joliet, Ill., were given a very pleasing holiday present by their employers, consisting of a trip to Chicago as the guests of the company. Free transportation was furnished, as well as seats at Powers' Theatre, and a fine dinner.

Gas Attachment for Coal Ranges.

The convenience of gas for cooking has led many who must use a coal range for their heavy work to use gas cooking apparatus to supplement their coal ranges or when there is no coal fire. The accompanying illustration shows a coal range attachment which the Excelsior Gas Stove Company of 34 Foster street, Worcester, Mass., are putting on the market. This attachment is really a hot plate in the form of a shelf and designed to occupy the place on a coal range that is generally occupied by the warming shelf. The hot plate is supported by two brackets attached to its outer edge and which run down and rest on the base of the stove. When it is not in use it can serve the same purpose as the warming shelf. The two tubes shown as extending from the back of the cut are the ends of the generator coil used for heating water when connected with a kitchen boiler. This generator coil is made of brass, and the same flame with which the cooking is done can be used for heating the water; or, this coil can be furnished with a special gas burner to increase the water heating capacity. The



Gas Attachment for Coal Ranges.

company issue a 16-page catalogue showing their water heater and coal range attachment, besides other specialties.

The Baltimore Stove Industry.

In a recent issue of the Baltimore *Sun* appeared a most interesting review of the stove situation in that city, in the shape of a communication from the B. C. Bibb Stove Company. The matter has in it so much of general interest that we reproduce it, as follows:

In common with the varied industries of the city of Baltimore the stove manufacturers have shared in the general prosperity of the country. Not for years have they run their foundries so steadily or given employment to so many men as during the year just closed, and the output, both in quantity and variety, has been correspondingly large.

The manufacturer, the jobber and the retailer have alike been benefited by the increased demand for heating and cooking apparatus of all kinds. Furnaces, ranges, cooking and heating stove of all sizes and styles have been in unusual demand, and wood air tight stoves, whose life it was supposed would be short, still maintain their popularity, and instead of the demand becoming less it seems to be growing.

Although pig iron, which enters so largely into the cost of manufacturing stoves, has declined to a certain extent from the high prices of several years ago, the cost of making stoves has not materially lessened, as other materials have advanced in price; consequently the manufacturer has not been able to materially reduce his prices from what they have been for several years past.

Baltimore manufacturers naturally look to the South as their best customer, and it is there that the bulk of the product of her foundries is marketed, yet no inconsiderable portion is sent in other directions.

Competition in the stove trade is as sharp as it is in that of most other lines of goods, and Baltimore manufacturers and dealers have for their strongest competitors the producers of these goods located directly in the South, while some of the larger manufacturers of the West also send their goods to that market. Still Baltimore need not fear, so long as her manufacturers offer first-class goods at fair prices and hold to fair and upright dealing, that she will not continue to control the bulk of the stove trade of the South, as she has in the past.

As for the year 1902, we have every reason to believe that the stove trade will be fully up to that just passed, with possibly somewhat higher prices.

ODD PLATES.

The Avondale Stove & Foundry Company of Avondale, Ala., have decided to build a Stove and Hollow Ware plant on Ninth avenue, Birmingham, Ala., where they have recently bought a large tract of land.

United States Consul John H. Grout, at Valletta, Malta, reports to the State Department that a change in the regulations regarding the storage of gasoline in Malta is likely to open up a field for the introduction of Gasoline Lamps and Stoves in that island. Up to within a few months the import of gasoline into Malta had been prohibited. Recently, however, it was decided by the Government to admit it and permit its storage both for sale and for private consumption under certain restrictions. Consul Grout believes that a market for American Gasoline Stoves is likely to result.

We have received from the Eclipse Stove Company, Mansfield, Ohio, a series of colored folders containing their Christmas and New Year greeting to the trade, together with an announcement, in verse, of what the trade may expect in the field of Eclipse Stoves and Ranges in 1902. On the outside flap are the words: "Watch the Eclipse in 1902," together with the company's Eclipse trade-mark. A feature of these folders is that they bear the portraits of the salesman who will cover the territory to which the particular greeting is sent. There are eight different folders in the series.

The contract for the erection of the new building of the Simpson Stove & Mfg. Company, Canonsburg, Pa., has been awarded, and active work on it will be begun just as soon as the weather will permit.

The Phillips & Clark Stove Company, Geneva, N. Y., closed their works on December 24 for the annual inventory and repairs. It is thought that the improvements will require about six weeks to complete.

The Stove plant of Spence, Baggs & Co., Martin's Ferry, Ohio, shut down last month for a period of two weeks, in order to take the annual inventory and make such repairs as might be necessary. We understand that 1901 was a banner year with the company, and that they are still behind in their orders.

It is announced that the McClary Mfg. Company of London, Ontario, have recently secured control of the Stove works of the Copp Company at Hamilton. Colonel Gartshore, of the first-named company, intimated, in an interview with the representative of a local paper, that the works would probably be operated for some time at least, if not permanently.

The Faultless Mfg. Company of Chicago, Ill., is the name of a concern recently incorporated with a capital stock of $10,000. The incorporators are Oscar Millsap, Claus Krabel and W. D. Elmer. The new company will manufacture Stoves and Ranges.

The Gold Coin Stove Company of Troy, N. Y., recently rented the premises at the corner of Hoosic street and Fifth avenue, formerly known as the Eddy Foundry, which they expect to occupy very soon. Some alterations will be made to the interior in order to meet the requirements of the Stove company.

Visitors to the showrooms of A. L. Canfield, 284 Pearl street, New York, not only see a handsome line of Beaver Stoves and Ranges, made by the Danville Stove & Mfg. Company of Danville, Pa., and a fine line of Gas,

Gasoline and Oil Stoves, but are also presented with a very dainty calendar for 1902.

The agents in charge of the various branches of the Reading Stove Works, Reading, Pa., gathered at the main office of the company on January 3 for the purpose of having what they designate as a "shop talk." The reports made by the branch managers were of a highly encouraging nature, and we understand it was decided at this conference to make a number of extensive improvements to the plant in Reading. The year's business of the company is said to have been more satisfactory than any in their history. On the evening of January 4 the agents were tendered a banquet by the company at the Mansion House, Reading.

The Syracuse Stove Works, Syracuse, N. Y., have recently rented for storage purposes the property of J. H. McDowell, formerly used by the Syracuse Wall Paper Company. The Stove company had been renting outside storage for some time, but the building named being nearer and more convenient for their use, they canceled the existing lease in favor of the McDowell property. We understand that the new arrangement gives the company a great increase of storage room, which they can utilize to good advantage.

The Chelsea Stove Company, Chelsea, Mich., held a meeting in the latter part of December, when they declared a semiannual dividend of 4 per cent. The affairs of the concern were shown to be in excellent condition, and the business to be rapidly growing.

The Baldwin & Graham Stove Company, New Castle, Pa., are about resuming operations at their plant, which has been idle for the purpose of making the annual inventory and repairs.

An attractive little folder is being sent out by Mahood & Co., 14 North Second street, Philadelphia. The folder is printed on gray paper, with dark blue and silver lettering, and contains a greeting for 1902, together with the statement that the firm are handling the latest improvements, the most handsome designs and the most popular kind of quick selling goods in their line. They say that their salesmen will call upon the trade soon after January 2 to explain the merits of their goods, which include Blue Flame Oil Stoves, White Flame Oil Stoves, Gasoline Stoves, Ovens for Gasoline and Oil Stoves and Ranges of all styles.

Bergstrom Bros. & Co., Neenah, Wis., manufacturers of Royal Stoves and Ranges, are favoring the trade with an exceptionally fine wall calendar. This calendar consists of a large brass bound card to which are attached leaves of good size bearing the necessary details for each month. The figures are large and plain, enabling them to be easily read at a long distance. The back of the calendar is printed in scarlet and gold, making a handsome setting for the monthly leaves.

Edward R. Janes died at his residence, 253 West 107th street, New York, on Wednesday, January 8, aged 73 years. As a boy he started in business, joining his father's firm of Janes, Fowler, Beebe & Co., manufacturers of stoves, ranges and furnaces and iron founders. The business is now continued by his sons, Henry E. and Herbert Janes, under the name of Janes & Kirtland, at 725 Sixth avenue, New York. The firm furnished much of the iron work in the dome of the United States Capitol Building at Washington, D. C. Mr. Janes is survived by his wife, four sons and two daughters.

Mullin Wayne, who formerly represented the Cinderella line of Stoves and Ranges for the Pittsburgh Stove & Range Company, has resigned to accept a position with the Prizer-Painter Stove & Heater Company. Mr. Wayne will be located at their Pittsburgh office, which will be opened in the near future under the management of Charles W. Goodnough.

C. W. Reals advises us that the report published last week to the effect that he had severed his connection with the Keeley Stove Company is erroneous. Mr. Reals has been with the company named for three years, is still with them, and expects to remain with them as their representative in Ohio, Michigan and the city of Chicago.

Letters From the Trade.

Receipts for Remittances.

The following communication from a concern in New Hampshire mentions some objections to the practice of discontinuing sending receipts for remittances as the matter is seen from our correspondent's standpoint:

We have noticed articles in *The Metal Worker* on the subject of manufacturers and jobbers not sending receipts for remittances in payment of invoices, looking upon the indorsed check sent as receipt enough. How does that work when payments are made with bank drafts, which, of course, go back to the bank? There is great effort made now to have all payments in that manner, many refusing to take private checks.

It seems to us that it is very much better to have a receipt. We pay, as is universal now, by sending statement on remittance blank with items, often two or three, and deducting cash discount and any overcharges or shortages. That blank we want back receipted, as we often want to look back for some reason to the statement. If the merchant has no receipt and the cashier's check is in the bank he is badly off.

We also want to know at the time whether parties have received the remittance and not have to wait to find out until perhaps two months or so afterward, when they send statement with notice of draft or a request for payment. The proposed way would work to the advantage of large manufacturers or jobbers to save expense, but we don't think their customers would like it. We should not.

Plural of Tailors' Goose.

The following inquiry relating to a matter which has perplexed some hardware merchants and has been the subject of facetious treatment is referred to our readers:

We are offering a chance on a set of sad irons to any person who will give us the correct wording of an order for six tailors' goose, or geese, or the plural of goose. Wish you would give us the proper wording and oblige, that we may give the prize to the right party.

Pricing Stock in Plain Figures

A correspondent who is connected with a store in one of the Connecticut cities writes:

I have read the article on show window display by J. C. Sarchet and would like to take exception to some of his ideas on this subject. I do not think that a large variety of goods in a show window is as effective as a small variety and a lot of it. I find that it pays me to mark my goods in plain figures as to the selling price, as when so doing the general public places more confidence in me.

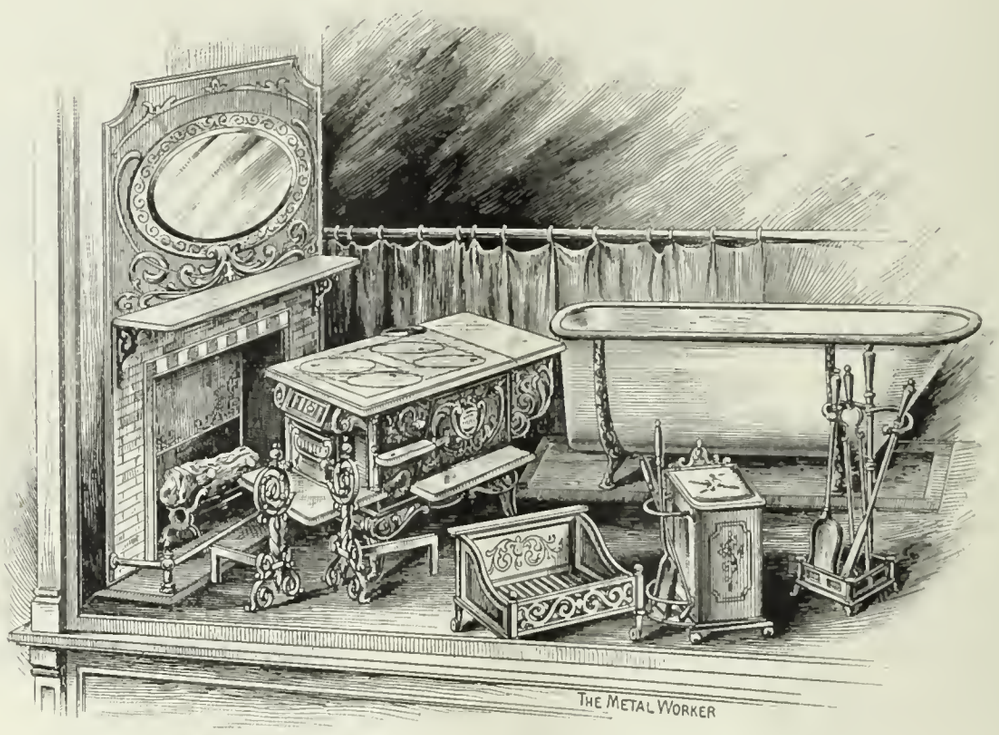
Another point: I had an extra clerk here before the holidays, and in the midst of one of my busiest evenings he was taken sick. What did I do but ask a bright friend to help me out. As my goods were marked plainly he stepped right in and sold goods as well as an experienced clerk. What would I have done if my goods were all marked with private marks?

S. W. Smith, successor to Stoutenberg Mfg. Company, Keithsburg, Ill., issues a folder relating to the Cannon Oiler. This Oiler is formed from an ordinary Oil Can with force pump attachment and long spout. A slight pressure of the plunger permits a drop only to escape from the spout, while greater pressure will produce any amount desired, or throw a stream. This feature is referred to as specially serviceable in the use of thick and sluggish oil, as it can be easily forced out. The Oiler may be held in an inverted position without the loss of a drop of oil, and overhead machinery may be oiled without tilting the Oiler.

Murray & Co. have succeeded Murray & Hall in the Hardware, Stove and Farm Implement business at Winters, Texas. The new firm have enlarged the store, thus materially improving their facilities.

WINDOW DISPLAY OF FINE GOODS.

The sale of the best grade and most profitable goods can be promoted in any locality by displaying them in a show window so as to present a sufficiently striking appearance to attract attention and yet securing the pleasing effect contributed by good taste in the selection and arrangement of the articles exhibited. A particularly good example of this method of trade building is shown in the accompanying sketch of a show window in Norwalk, Conn. The window is a very wide one, there being but one in the front of the store. It is not partitioned off from the rest of the store, but is separated simply by a low rail, from which is hung a plush curtain which makes a good background for the display. In the window, on the side away from the door, stands an oak mantelpiece and fire place, in which is a gas log. This appeals to the eye of many people. Then the range and the bathtub attract attention. In front of these are andirons, a grate and fire sets. The whole arrangement and display is a bit unusual, and is calculated to appeal to the best class of trade.



Window Display of Fine Goods.

Stove and Hardware Dealers.

The interests of the Lisk Mfg. Company and the McLaughlin-Martin-Parkhurst Company, both of Canandaigua, N. Y., are to be consolidated under the former style. The Lisk Company were organized 12 years ago and manufacture Antirust Tinware. The McLaughlin-Martin-Parkhurst Company were formed during the past year for the purpose of manufacturing Enameled Ware. The leading stockholders in each company are interested in the other, so that the matter of consolidation will not be a difficult one.

Bewley Hardware Company, jobbers and retailers of Hardware, Agricultural Implements, Stoves, &c., Chester S. C., have applied for charter with privilege of increasing capital stock from $10,000 to $25,000.

A. A. Rumreich has succeeded the firm of F. P. Rumreich & Son in the Hardware, Stove and Sporting Goods business in Pisek, N. D. The store room has been materially increased in size and a tin shop added, 22 x 14 feet in dimensions.

James G. Geagan, who was for 16 years with Clancy Bros., Syracuse, N. Y., and for 13 years was their sole representative on the road, has secured an interest in the Drennan-Briggs Hardware Company, 325-327 West Fayette street, of that city, the name of which was changed to the Drennan Hardware Company January 1. Mr. Geagan will act as general manager. In addition to the line of Iron, Steel, Heavy Hardware, Galvanized Iron and Tin Plate now carried by the firm, they will put in a complete line of Wagon Wood Work and Carriage Makers' Supplies.

William Bauer and Henry Schluckebier have dissolved their partnership in the wholesale and retail Hardware, Agricultural Implement, Stove and Wagon and Buggy business in Petaluma, Cal., and it will hereafter be continued by Mr. Schluckebier under his own name.

Thos. Naylor, having disposed of his business at Boyne City, has bought the general store of D. Mills, Gladwin, Mich., and is carrying a line comprising Hardware, Stoves, Bicycles, Tinware, furniture, groceries, dry goods, &c.

Beginning at 10 o'clock on Tuesday and Wednesday mornings, January 14 and 15, E. Bissell & Co., wholesale auctioneers, will conduct a trade sale of 10,000 to 12,000 cases of Enameled Ware seconds. The sale will be held at 12 Murray street and 15 Park place by order of the National Enameling & Stamping Company, and Lalance & Grosjean Mfg. Company. The assortment to be sold will be very large and staple, and will consist of Blue and White, Venetian White and White Regal, Pearl Agate, Peerless and Gray Steel Enameled Ware seconds.

The Olympia Hardware Company of Olympia, Wash., recently had a drawing for a Steel Range, which was secured by Miss Louise Pittman, a young lady who is employed as stenographer at the office of the West Side mill in that city. The committee having charge of the drawing consisted of Mrs. Charles Turner, Mrs. Charles O'Neil and Mrs. Ione Smith.

The Lalance & Grosjean Mfg. Company, New York, have placed an order in Philadelphia for a complete galvanizing outfit for their factory at Woodhaven, L. I. The plant will be used for the manufacture of Galvanized Ware, a line that the company have not heretofore produced. The new plant will be ready for operation in about six weeks' time.

The great power plant for the Louisiana Purchase Exposition, St. Louis, Mo., which is to be the largest in existence, having a capacity of more than 30,000 horsepower, will probably use Texas oil for fuel. The director of works of the exposition is investigating the feasibility of using oil instead of soft coal. If he finds that the expense of the oil is not prohibitive it will be adopted.

TOMMY ENGAGES IN THE HARDWARE BUSINESS.

BY H. F. BELL.

Me an' Uncle William has gone into business together. We're pardners. He said so. Pa wanted to know if I was goin' to be a silent partner when I told him our plans. Silent means still. I don't want to be that kind. Seems too much like home. I felt kinder worried 'bout it. I asked Uncle William if that was the sort he 'tended me for to be. He said, "'Course not. I wouldn't have no partner that couldn't jump over a broomstick or help me whistle 'Yankee Doodle' whenever 'twas 'propriate." I can do both them things.

Uncle William's nice. 'Most as nice as pa. He's brother to pa. So pa's brother to him, an' they each of 'em together got gran'ma for their mother. I don't know as it could been 'ranged that way anyhow, but I'd like to been little when pa was, an' Uncle William, an' had gran'ma to bring us up all 'long of each other. Wouldn't we had just jolly times though! Gran'ma don't 'spect a boy to be a man 'fore he gets over bein' a boy.

I 'magine we're goin' to have some fun now, in business, I mean. Pa ain't in it, 'cept to advise an' cheer us up when we come to meals. An' if we get right to a place where we don't know whether we'll be glad or sorry 'bout what we're goin' to do next, pa's splendid to tell us. He told us one thing to remember in hardware business, or any other. "Always in drivin' a bargain 'bout sellin' anything," he said, "be sure to strike while the iron's hot." I didn't have time to ask him who we'd got to strike, or what for, or what we must keep hot flat irons for. Maybe Uncle William will understand. I'm sure if we've got to strike our customers with a flat iron to make 'em buy, an' have it hot, too, it's awful funny business. Funnier than I s'posed 'twas. Maybe I'd ruther be a silent partner after all. But I guess I'll keep in the firm for a while, 'cause Uncle William's a awful peaceable man, an' I don't b'lieve he'd do no such way to make folks buy.

The way me an' Uncle William got this business was this: Mr. Ironsides, the man who don't own the hardware store in our village no more, sold out. 'Taint his'n now. It's our'n, Uncle William's an' mine. He's moved here, Uncle William has. There's a sight to do when you're just beginning to go into business, 'specially when you buy out a man. Uncle William had to 'range the boxes of things all over on the shelves, an' look over all the books, them big books, where they write down into 'em what you sell, an' when you do it an' how much the man paid, or didn't pay. He counted up how many stoves Mr. Ironsides had sold last year, then counted what was left. Oh, it was bad as cleanin' house when ma's at the head. We've both been dreadful busy; Uncle William couldn't hardly find time to eat. I could. I didn't feel the 'sponsibility quite so much as he, I s'pose.

I thought I was goin' to stay out of school with this on my hands, but ma won't let me. She disappointed me. I can't only be in the store after school an' Saturdays. I 'splained to Uncle William how 'twas. He said he'd have to try and get along without me. Maybe that's what "silent partner" means--not bein' there.

Another thing had to be tended to—the sign. Out in front, you know, to let folks understand we was a hardwear store. In cities, pa says, they mix things up a good eel. In stores you can jist step through one of them big ones with them all glass front, an' find anything you want, 'sides lots you don't want. They keep everything, from a paper of pins to a bycicle.

Me an' Uncle William 'cluded we'd set folks a good example an' be more orderly. If we was goin' to have a tin an' hardwear store, why let it be tin an' hardwear, not groceries, nor millinery. We wanted a nice sign. That man who don't own it no more, he had one. It was a teakettle, hung out on a stick, right 'cross the sidewalk. It used to swing back an' fourth awful when the wind blew. One day a accident come out of that teakettle. The wind was blowin' then. I seen it. Mrs. Sampson was goin' along. She is tall an' has dreadful long arms. Sometimes when she swings 'em she makes me think of them long wooden ones at the railroad crossin', when you can't get across till the train of cars gets by. She had a umbrel. She run right 'gainst that teakettle, her umbrel did, an' knocked it off the end of that stick it was hangin' up on. It fell onto her bonnet, an' she an' the teakettle an' the umbrel an' the bonnet all laid on the sidewalk together.

Bein' a woman she screamed. Everybody run to pick her all up, all to once. She give Mr. Ironsides a awful scoldin'. The teakettle wasn't hurt a mite. I guess stickin' on top of her head softened the fall. Mr. Ironsides picked up the teakettle.

"I guess she ain't much hurt," he said. "Some of the paint is rubbed off, but her ears stand out stralght as ever. She's quite old, but she'll last a spell yet. I guess she's worth savin'." Miss Sampson she set up on the walk, an' she told Mr. Ironsides she wanted him to understand she didn't use no paint, an' her ears didn't stand out no worse than his'n, an' he ought to be 'shamed of himself, callin' her old, an' hintin' how much she was worth. She said she was goin' to law 'bout it an' make him pay. Mr. Ironsides looked 'frald. He said: "Madam I wasn't talkin' 'bout you a tall. I was talkin' 'bout this teakettle." The boys all laughed, an' Miss Sampson scowled at us, took up her umbrel and limped off toward home.

Mr. Ironsides hung it right up again, an' there it staid till me an' Uncle William bought it with the rest of the store. We give it to ma then. She heard us talkin' 'bout it one day, an' she said she'd like to have it to keep matches in. Couldn't no mice get 'em then, an' drag 'em 'round an' set the house on fire, she said. I guess its a pretty good thing, too. The house hain't never got a fire sence she took it.

Uncle William asked me what kind of a sign we should have. I told him I thought a good big one with my name an' his'n on it would be all right. He said that would look nice, but he was 'fraid there wouldn't be room for two such long names. He wanted to put somethin' onto it to tell folks what he could do, like mendin' tinwear, makin' pipes (not smokin' pipes) &c., 'sides his name, you see. He asked me if my feelin's would be hurt if in case he was cramped for room he should leave mine off. I told him I s'posed that would do, seein' 'twas all understood that I belonged there. It's just like in 'rithmetic. Sometimes there's a big figger to set down an' one to carry. The big figger you write down an' the one to carry you don't. It's there all the same. Uncle William's the big figger. He sets down, an' I'm the one to carry. I carry coal an' water an' anything anybody else don't want to.

It's a awful bother to be too little for everything. When you ain't only ten years old seems as if there wasn't nothin' hardly you was big enough for, 'less 'tis to chop kindlin's an' fetch in wood, an' pull weeds, an' hunt up spectacles for your grandmother, an' sech chores. They keep a feller dredful busy, but they don't 'mount to nothin'. Anything ma don't want me to do she gen'ly says I'm too small. But when there's a mean, hateful job on hand, an' I feel all kinder tired out 'fore I begin, she says, "Why, I'm s'prized; such a great big strong boy as you are." Uncle William is more carefuller. He talks it over with me an' keeps talkin' till I think just as he does. Then I'm willin' to do anything he mentions.

There's two dry good stores here in town; one big one little. You'd 'most 'magined that big one was a hardware store; they keep so many of one kind of goods, or did, 'fore something happened that did happen when we first got to running. When they saw our windows all fixed up, an' read the printed notices Uncle William sent 'round 'bout the new firm—that's me an' him—they hustled right up an' sent a boy 'round to every house with papers printed onto 'em how cheap they was sellin' carpet tacks an' bread knifes, an' hammers, an' dishpans, an' other hardware things. Uncle William's cousin's step-father has got a dry goods store down in Columbus. He wrote to him to send on a big box full of things an' he'd sell 'em for him. I s'pose Uncle William must have 'splained all the circumstances, 'cause it come—the big box. All sorts of pretty things was in it when we took off the top lid.

Uncle William told me to take the saws an' axes an' oil stoves an' such decorations out of the north wludow; the one Mr. Pennyworth can see plainest from his store. I did. Uncle William took them dry goods things an' fixed 'em all in that wlndow. My, didn't it look pretty! Silk an' lace curtains, an' sofy pillows, an' them pretty little pink an' blue sacks women put on when they comb their hair, an' kids—real ones—gloves, you know, an' lovely shirt waists. Ma snid nobody hadn't never had none like 'em in our town before. We put n big card in the window that said: "All at Cost. A Present to Each Customer." Our store was full all day. When 6 o'clock come there wasn't nothin' left in that window but a ginham apern an' a 5-cent handkerchief. We took them to ma when we went to supper.

Them farmers from the country bought lots of tinware an' nails and things besides. The present Uncle William give 'em all was a new bright tin cup. Them other folks 'cross the way hadn't nothin' to do all day 'cept to watch us. I was glad 'twas Saturday. I was awful tired though when night came. So was Uncle William. "T'was a satisfied tired," he said, when he was countin' the money. I got 25 cents of that money myself. Uncle William said he wouldn't want no partner an' not pay him nothin' I wouldn't want him to, not if I was the partner.

Mr. Pennyworth hain't never said much in public 'bout his hardware stock since me an' Uncle William had our grate sail of dry goods. He come over that next week an' told Uncle William he'd 'bout made up his mind it didn't pay to keep hardware an' dry goods all to once. He wanted us to buy him out. We did. We like each other real well now. We're real sociable since we made up, an' he found we didn't have no more dry goods. We told him when anybody inquired of us for anything we didn't have we'd send 'em over to him. Me an' Uncle William thinks it's better for us all 'round than if it hadn't never happened a tall, 'cause now if a man wants a hammer or a woman a paper of tacks we're sure of that man an' that woman, 'cause the nerest hardware store is 7 miles off, over to Spindleville. We mend tin things, too, that's kinder worn out. Jack, he does it. Me an' Uncle William's 'prietors an' Jack he works for us. He puts some sort of stuff on that covers the old hole all up awful bright an' nice. It looks like a new patch on a boy's old pants.

After we had our dry goods sale folks begun to come in real thick. Our money drawer got so heavy Uncle William said I'd better not try to pull it out no more "'count of danger," he said. I couldn't see no sign that anything would break or anything. But then I s'pose the things you don't think the most about is the very ones that a good many times often happens. Pa always told me, "My son, never ask questions 'bout anything you can find out for yourself." I didn't this time. I was sorry, too, in three ways. Sorry I tried to find out, sorry I did find out, sorry I had to be sorry after I found out. You see I thought, bein' a partner, I might as well know 'bout that money drawer. Maybe I'd have to go there some time when Uncle William wasn't 'round. On business, of course.

One day when he was gone to see 'bout puttin' a furnace in the church I thought 'twonld be a good chance to 'vestigate. I wanted to find out how it worked. I found out. It worked quick. Uncle William always called it the "Hold Fast." I thought he meant 'cause it held the money fast as you drop it in. You can't always tell what the name folks calls a article by means 'till you get 'quainted with it. I feel pretty well 'quainted with this one now. I know it means that when you try to pull the drawer out from under side, an' touch a little iron thing under there, something springs right out an' pinches hold of your hand an' makes you scream, 'cause it won't let go. I found that all out in 'bout three minutes; quicker'n I could learn a spellin' lesson. I couldn't get away. Not 'thout leavin' part of my hand. I 'cluded to stay. Uncle William came. I was cryin'. He unlocked me. I'll have to wear a plaster on my hand for a week ma thinks. That's hard wear, pa says. An' the money drawer didn't come open neither. I feel most sick. It always makes me feel so when so much trouble happens that don't 'mount to nothin'. Pa said he should think I'd know how 'twould feel to be a burglar now. It made me 'most shiver. Uncle William was real good. He said honest people, specially boys, often gets caught if they go too near the traps set for rogues.

There's a awful stingy man lives here in Toppletown. He come into our store one day an' bought two of them little windows what you put into stoves. Mikeys is their name. Pretty soon back he come with one of 'em. He wanted to sell it back to Uncle William. He said he split the other one an' made two of it so didn't need this one. We took it, that Mikey, an' then that man said he should 'spose we might be generous enough to 'low him somethin' on it for washin' it. Uncle William told him he'd 'low him just two minutes to get outside the door onto the sidewalk. He went. We have a grate eel of fun here in our hardware store. I enjoy everything, 'specially some things more than others. I druther keep store than be policeman or theological student.

Defects in Trade Unions.

At a recent meeting of the Central Labor Union at the Labor Lyceum in Cleveland, Ohio, Harry D. Thomas, business agent of the union, gave an unusually interesting and suggestive address on the principles of trades unions and their defects in actual practice, from which we give the following extracts:

The principles of trades unions, he said, were elevating. The reason this was not more generally recognized was because they were compelled to bear the odium of what he called "cheap" and "fake" organizations. It could be laid down as a cardinal point that any trade or craft that was not thought enough of by the men who were employed in it to form an organization that was international in its scope and fortify it with a large fund was hardly worth bothering with.

"To illustrate what I mean," said Mr. Thomas, "I need only mention a meeting I attended to-day, when men employed in a particular line of work attempted to organize a union. The first thing they insisted upon was to make the initiation fee for the charter members as low as possible. Some of them wanted it as low as 50 cents, and when it was pointed out that they would have nothing to fortify themselves with in case of trouble or industrial depression, their answer was that the fee could be raised later. Right there is the great trouble with trades unions.

"The great majority of the people who join them do so not for the purpose of benefiting the general condition of the men who are employed in their trade, but simply to benefit themselves at the expense of those who do not join the union. For instance, 20 per cent. of the members of a certain craft form a union. Then, instead of trying to induce the other 80 per cent. to come in, they raise the fees to keep them out. What is worse yet, they make laws governing apprenticeship and try to prevent boys from entering their trade. In short, their entire purpose is not to benefit the condition of those in their trade, but to simply benefit themselves. They do not take into consideration the fact that if they can prevent boys from learning their trade, those boys will overcrowd some other trade.

"But no union can lay down rules and specify how many boys shall learn the plumbers' trade, or the carpenters' trade, or the moldors' trade. They may do so for a while, but in time things will adjust themselves along natural lines. When the Amalgamated Association of Iron and Steel Workers was at its greatest power some of the members made all the way from $10 to $25 per day. They had restrictive rules and looked with contempt upon the helpers, the rod men, and wire drawers. When they held their conventions and the helpers asked that something be done to improve their condition also, the answer was, 'We are looking out for ourselves and you do likewise.' It never occurred to them that the helpers were men with feelings, until last summer, when these very helpers, who had so long been looked upon with contempt, took their places, with the result that the strike was a total failure. In the long run no craft or clique of men can advance themselves at the expense of their fellow workmen. There will come a day of rockoning and the employers will reap the benefit."

Mr. Thomas referred to the International Society of Carpenters and Joiners and the International Society of Engineers as the best types of trades unions.

"The carpenters and joiners, of which I am a member," he said, "was organized away back in 1856 in England. Our strength lies in the fact that our fund is never allowed to go below $10 per member. It doesn't belong to any particular local or division, but at the order of the Executive Committee will be transferred to wherever it is needed. Some years ago all the money we had in this division was transferred to some of the cities in England and Canada where there was trouble. We didn't feel bankrupt, however, and later, when the depression came on between 1893 and 1896, we received $4 for every dollar we sent away. The organization now has a fund of about $1,500,000, and if the depression keeps up in England a great deal of this will have to be used to help the members who are out of employment.

"Whenever a 'fake' organization is formed a strike is almost sure to follow. Next we see begging expeditions to help the strikers, but they almost always fail.

"Another defect in trades unions is the fact that they do not keep up with the progress made in their own crafts. A revolution has come about in nearly all the trades during the last 20 years by the invention of machinery, and yet the rules and regulations remain the same as they did."

A WATER WHEEL FOR THE WINDOW.

It is well known that moving objects attract more attention to a show window than any other kind of a

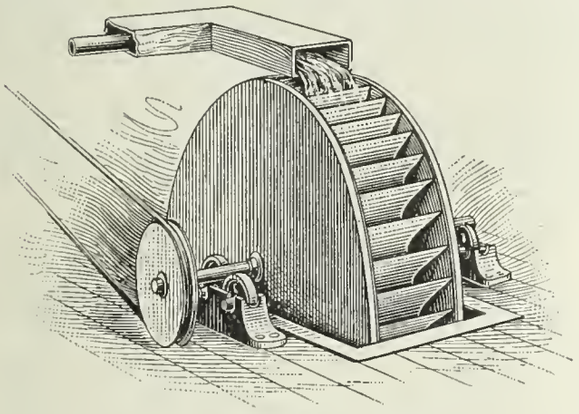


Fig. 1.—The Water Wheel in Position.

display that can be made. Many merchants exert special efforts to attract crowds to their windows just before Christmas, and employ mechanical displays only at that season. Where there is no shafting in the

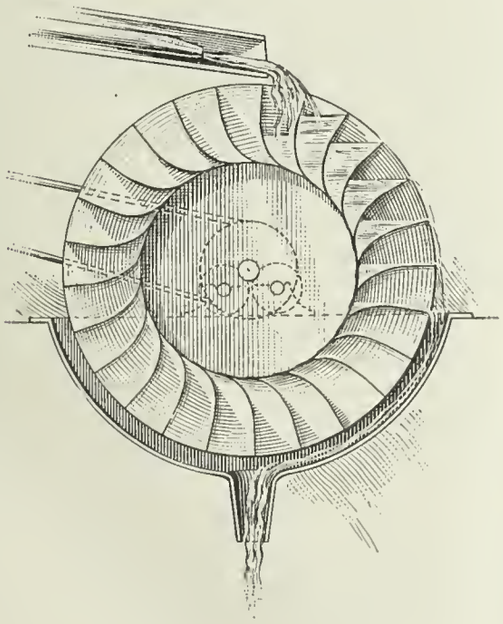


Fig. 2.—Section of the Wheel.

building, power for a mechanical display can be supplied by either electric, spring or water motor. Below is given a description of an overshot water wheel that has been used occasionally for the past few years in the show window of J. M. Page & Co., Naugatuck, Conn., and was made by them in their own shop.

This wheel, as it is in position on the elevated platform that is placed in the window, is shown in Fig. 1. A section of the wheel is illustrated in Fig 2. The sides of the wheel are made of two pieces of galvanized iron cut into circles 24 inches in diameter. Between these, and perpendicular to them, are placed, and securely soldered, 25 pieces of galvanized iron 5 inches wide and

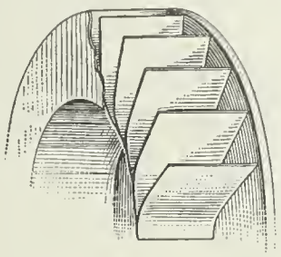


Fig. 3.—Detail of the Buckets.

6 inches long, so that the sides of the wheel will be 5 inches apart. These are arranged to form the buckets and are bent as shown in Fig. 2. It will be noticed that the bottom of each bucket partition is soldered to the bottom of the next one. Arranged in this way the opening of each bucket will be about 3 by 5 inches and the buckets will be about 5½ inches deep. It is essential that they be bent properly so as to hold the water as long as possible and thus secure the maximum efficiency. The construction of the buckets is more clearly shown in Fig. 3. When the galvanized iron wheel is completed, all joints being properly soldered, rigidity is given to it by fastening to each side a circle of 1-inch boards, 24 inches in diameter, as illustrated in Figs. 1 and 3.

As before stated, when this wheel is used in the window an elevated platform is put in to hold the wheel and the display. In this platform a well is cut, as shown in Fig. 1, and in it is placed the galvanized iron

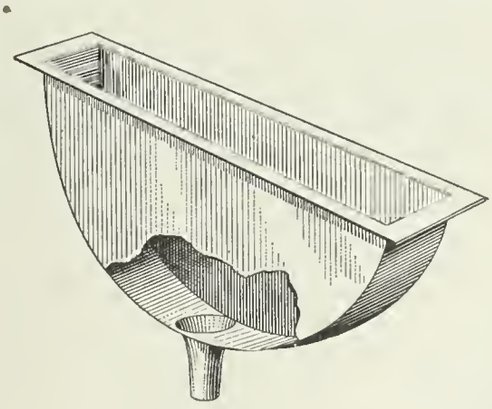


Fig. 4.—The Trough Catching the Water.

trough illustrated in Fig. 4, to catch all the water from the wheel. The outlet from this trough connects with the sewer pipe. The wheel is supported by a shaft made of gas pipe that works on a grindstone bearing that permits it to revolve readily. On the shaft is fixed a 6-inch grooved pulley, on which a belt runs, working the display. The water to run the wheel is supplied through a ⅝-inch lead pipe flattened on the end, so as to give a stream about the size of a lead pencil. This wheel has been used in making several displays, in some of which it is in sight and in others hidden. When in sight the pipe is placed in a wooden box or sluice, as shown in Fig. 1. The water fills the buckets and its weight causes the wheel to revolve slowly. The power obtained is sufficient to move fairly large displays slowly. One of the features of this motor is that when it is once in place and started it requires practically no attention, except turning the water off at night and on again in the morning.

AN INVESTIGATION OF PLUMBING.

An important question has been presented by United States Senator McMillan to the Commissioners of the District of Columbia as to the number and character of unsanitary buildings in the city of Washington, and to the extent to which bad plumbing exists in buildings in the city. The inquiry was suggested by the proposed expenditure of an immense sum of money to provide for the removal of disease germs from the Potomac water. The ground is taken that the end to be attained by this expenditure will be largely nullified if plumbing is allowed to exist which is inimical to the public health. Should the question presented be agitated it will naturally lead to a house to house inspection of plumbing, in which case there is no doubt but that the plumbing which exists in the city of Washington will be found to by no means come up to the standard required for new buildings. Where a house to house inspection, or any approach to it, has been attempted, much opposition has resulted, many property owners not being in a position to go to the expense of throwing away the plumbing system that they have and providing a thoroughly sanitary system.

There can be but little doubt that the whole plumbing trade will favor the step, which is for the public good. It is eminently proper that this important step in sanitary work should begin in the capital city of the nation. Should the investigation be carried out to any considerable extent, the highest law making body will be put in possession of valuable information as to the character of plumbing that exists in an old city and its effect on the general health. The investigation will also provide a correct idea of the opposition which the citizens will present to an examination of their property that is likely to force upon them an unwelcome expense. It is to be hoped that this important subject will be thoroughly investigated. The outcome will be watched with considerable interest by the health boards and the plumbing trade throughout the country.

Presentation of Loving Cup to W. K. Pierce.

One of the most enjoyable social events of the season occurred at Syracuse, N. Y., on January 2, when W. K. Pierce, president of the Pierce, Butler & Pierce Mfg. Company, entertained the officers of the company, the managers of the different departments, the managers of the branch offices and many of the salesmen of the house. Most of the guests arrived on the night trains, so that the morning was spent at the main office in Syracuse renewing acquaintances and exchanging experiences of the year. The guests were provided with lunch at the Grill, and in the afternoon the entire party went to the plant where the Pierce boilers and radiators are made, so that the men might become thoroughly familiar with the process of manufacture and the facilities of their company to take care of their customers, which facilities have been greatly increased during the past year.

The leading feature of the entertainment was the dinner served in the evening in the dining room of the Century Club. Covers were laid for 26 guests. The decorations of the room and the table were pink, with an abundance of cut flowers. The *menu* selected reflected the excellent taste of Mr. Pierce as a host, and the meal was served and enjoyed as it only could be under the genial hospitality which is characteristic of that gentleman. At the close of the dinner, Thomas Wheatley, on behalf of the guests, presented Mr. Pierce with a handsome loving cup. This cup is of Colonial design, perfectly plain, and upon the face bears the inscription: "William Kasson Pierce, 1902, From the Boys." In presenting the token to Mr. Pierce Mr. Wheatley dwelt upon the pleasant relations which had always existed between the employees and the president of the company, and Mr. Pierce gracefully responded in acceptance.

The guests of Mr. Pierce were: William George, C. F. Bennett, Thomas Wheatley, P. M. Beecher, F. W. Fix, Jr., I. H. Frot de Veaux, R. C. Strong, C. A. Mosnor, Frank Kehoe, F. C. Matthews, W. M. Butler, J. J. Herbrecht, E. H. Giles, F. E. Buckingham and H. S. Gardner of this city; E. C. Molby, Frank Barrett, J. K. Simpkins, A. D. Burnett and I. H. Seward of New York; J. J. Bennett, E. A. Morriss and H. B. Secor of Boston, and W. H. Peterson and W. J. Bryan of Philadelphia.

The Crane Company's Profit Sharing Plan.

On the evening of December 31 the Crane Company of Chicago for the third time distributed among their employees a large amount of money as a Christmas gift, in recognition of the services rendered, and with the desire of giving their workers some share over and above their wages in the splendid prosperity that has come to the company in the year just closed.

Every person in the employ of the company, 3500 men and women in all, received a sum equivalent to 5 per cent. of the money each has earned in 1901. No limit was put on length of service; men only a month at work got 5 per cent. of that month's wages. Fifty clerks worked for two weeks figuring out these percentages, and late in the afternoon the pay wagons were sent out to the different branches of the company at Judd and Twelfth streets, Jefferson and Van Buren, Jefferson and Randolph and Fulton and Desplaines.

For several days it had been rumored about the various plants that the company intended to take some action of this character, but nothing was definitely known among the great body of workmen till the whistles blew at 6 o'clock, giving the signal for the close of the last moment of work in the old year. The men were stopped as they were about to leave for home, and were told to file in to the paymasters' offices, where each received his handsome gift with its accompanying holiday wish. The average value of the Christmas box was $36, though many drew a great deal more than that.

At every one of the plants, for an hour after the close of work, hundreds of men stood about the gates and talked of the generosity of the company. The amount thus disbursed was about $125,000.

A Brass Goods Catalogue.

Through the courtesy of Charles S. Hirschfeld, 82 Chambers street, manager of the New York office of Landers, Frary & Clark, New Britain, Conn., we have received a copy of their new catalogue of plumbers' brass goods for 1902. The catalogue consists of some 50 pages, the introduction stating that all the company's goods are made of the best material, that special attention is taken in grinding the ground key work to an exact fit, and that the finished goods are subject to a test of 150 pounds pressure. The company's compression faucet bibs and bath cocks are made with a square edge instead of a V-shaped thread, which, with the close fit and slightly hollowed seat, gives them an increased durability. Special attention is called to their Simplex stop and waste cocks, which can be made right or left hand without difficulty, and used with lever or T handle or hydrant rod. The first section of the catalogue shows a variety of brass liquor cocks with different styles of handles and with keys made with threads for screwing into casks, smooth so that they can be driven and also for soldering. Several different styles of compression cocks for use in connection with oil cans, water coolers and similar goods are shown. These are made to be secured by means of a flange and lock nut, and also to solder. In addition to a variety of styles of compression, plain and hose bibs for iron and lead pipe are some with flange and thimble. Compression stop and waste cocks for iron and lead pipe are also shown, together with wash tray bibs of different styles. The catalogue also includes a variety of basin cocks of the compression and self closing type. These are followed by double compression bath cocks and the Simplex stop and waste cocks, rough and finished, for iron and lead pipe, made in all the various styles necessary for plumbing work. The last page shows hose nozzles, lawn sprinklers and towel racks.

Sullivan & Ryan, Carbondale, Pa., have the contract to install the plumbing and heating systems in the Roberts Building, at Peckville.

Central Station Hot Water Heating.*

BY CHIEF ENGINEER ALBERT TICHELMANN OF DRESDEN.

Translated from the German by Charles F. Hauss.

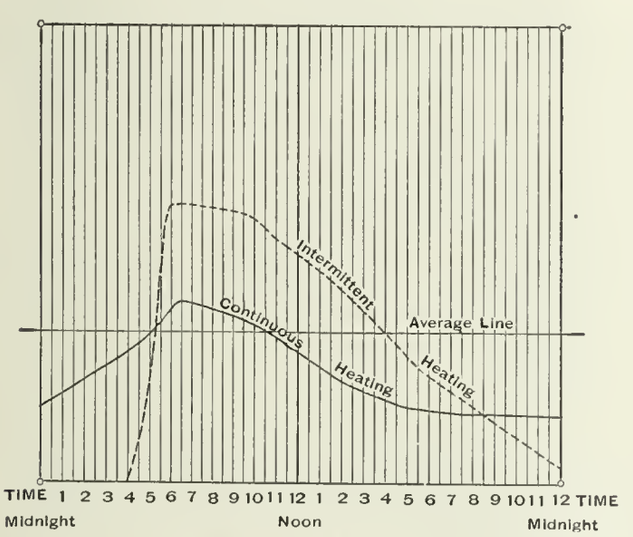
I submit to you here what is an open question, and one which will probably be brought much nearer its solution by being laid before you for discussion. When I speak of central station heating, I have in mind a plant which from the central point should supply warmth to points within a radius of 3000 to 6500 feet. For quite a number of years I have given much thought to this subject; at the beginning, of course, only theoretically.

In view of the fact that we have news from America of practical success in this direction, an open discussion of the question here, taking into consideration the present state of the science, would be of service and in order, for, as far as I know, a practical solution of the problem has thus far not been seen in Germany.

For the heating of either a single building or a series of buildings, the first question is, naturally, whether the heat is to be supplied by a new boiler, or if the source of heat is at hand which can be used without a great increase of cost.

If the heat is to be supplied by the erection of a new plant, high pressure steam heating has been always used by us in Germany. This method of heating has been in use for quite a number of years, and in many cases with the greatest success and satisfaction, even in cases of most complicated sets of buildings. It is a matter for the future to decide if this method of heating should, in certain cases, be replaced by a central station system of hot water heating or not.

If boilers are at hand, as is often the case in factories or in electric central stations with condensing engines, we have heretofore used only the high pressure steam in conveying the heat to distant points. In electric lighting stations the use of the necessary boilers for heating purposes has an especial interest, for the reason that the use of the power for heating and lighting comes at different times of the day, as indicated in the following diagrams shown in Figs. 1 and 2, illustrating the power used at different hours of January 15, 1901 (which was an average day), in a lighting station in Dresden, Germany.



Central Station Hot Water Heating.—Fig. 1.—Chart Showing the Demands Made on the Plant at Different Hours of the Day.

I add that the curve (power) shown in Fig. 2 remains the same all through the year. The diagrams show how much less of the power is needed for lighting purposes during the morning hours as compared with the evening hours, which goes to show that much of this power could be used in the morning with advantage for heating purposes.

In view of the fact that the attendance in the boiler room is generally the same, even though the surplus steam be used during the morning hours for heating purposes, it stands to reason that the use of the boilers of a central lighting station as a source of heat is practical for heating buildings.

This order of thought prompted the erection of the central station system of steam heating mentioned in the paper read by Professor Rietchel. In this system the lighting system, as well as the very complicated heating system, is supplied from a single boiler room. I add that, in this case, the use of steam was logical, for the reason that several of the separate buildings had steam heating systems installed, which were only connected to the central system. Considerations of economy would commend this system over any system of separate boilers.

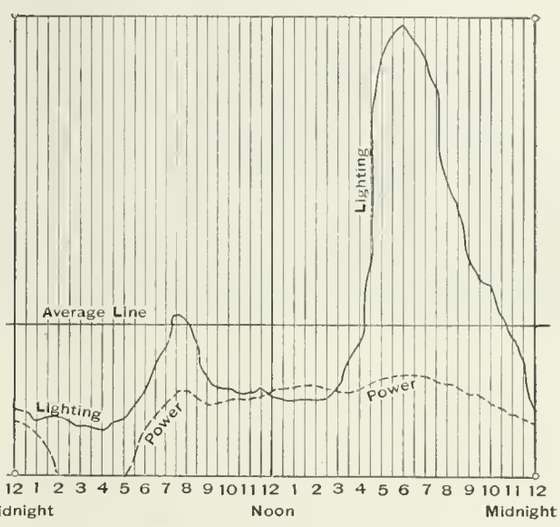


Fig. 2.—Chart Showing the Demands Made on the Plant for Lighting and Power at Different Hours of the Day.

The use in America lately of methods for using the exhaust heat from condensing engines is a matter of much interest and one that I will bring up later.

If we assume that we have a series of buildings, such as hospital or administration buildings, to heat with hot water from a distant central station, the question arises, Is it really practical to first make the high pressure steam to carry this to the separate buildings and there transform the same into hot water, or would it seem more practical to make the hot water in the central station, and deliver it at once, in this form, to the several buildings, it being assumed that the water can be delivered at its destination at the proper temperature? The loss of temperature in both steam and water systems is about the same, as will be shown later.

One advantage in the use of central station hot water heating is the simpler type of boilers, &c., than would be necessary for high pressure steam, which is naturally followed by a simpler method of operation and a total absence of the several converters * at the different buildings, as well as of the losses occasioned by their systems of piping and the natural loss due to the transformation of steam into water. In addition to this is the advantage that the heating of the separate buildings is simplified.

The hot water heating system can naturally be used for supplying hot water for domestic purposes, and the same claims made for a central heating plant can be advanced for a central warm water supply plant over isolated plants. I might mention that City Building Inspector Schmidt of Dresden has designed and is erecting a central hot water supply plant for the new hospital in Dresden, which, when finished, will afford a good comparison with the smaller separate systems.

To return to the matter of hot water heating; it may be well to mention the advantage of being able to reduce the losses in temperature in the piping system by being able to run the apparatus at a lower temperature in mild weather. In high pressure heating we can also reduce the pressure and consequent losses by radiation

* Read at the third meeting of the Society of German Heating and Ventilating Trades, August 13, 1901, at Mannheim, Germany.

* A converter is a hot water boiler in which the water is heated by the high pressure steam instead of coal.

In milder weather, but not to the same extent as in hot water heating, as the areas are figured at the outset for as low a temperature as possible.

The possibilities of central station hot water heating are readily seen when the following points are technically realized: It is necessary that the water can be forced from the central plant to the point of use and back again by a pump without the temperature of the water interfering with the proper action of the pump. Let us assume that the highest temperature of the flow pipe is 195 degrees F., and the return pipe temperature at radiators is 140 degrees F., and if the pump is connected to the return system, the return water will enter the pump at, say, 136 degrees F., and at a pressure of 22 to 37 pounds with a hight of building of from 40 to 80 feet above the cellar floor. There can be no question as to the reliable action of the pump under these conditions.

A second important thought arises with the question whether the proper end temperature can be secured without too great a velocity in the system and a too large demand on the pump. The expense of operating a pump only need be taken into consideration when it is necessary to operate it with gas or electricity. But if a small steam boiler is at hand, as is the case in hospitals,

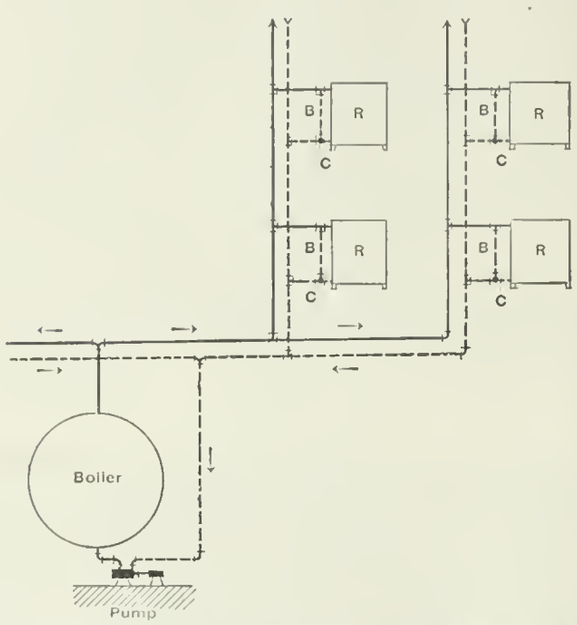


Fig. 3.—Piping of Central Station System, Showing Radiators, By Passes, Three-Way Cocks at Radiators, and Flow and Return Mains.

&c., for cooking, laundry or disinfecting purposes, which is always in use, the power for the steam pump can be gotton from this source, and the exhaust steam from the pump utilized in helping to warm the water. Hence the cost of operating the pump is very slight.

I will now illustrate to you how to make a central hot water plant independent of the number of radiators that may be in use at any time by a simple arrangement of the pipe system. A system of this kind is shown in Fig. 3. The pipe system is the same as is used for ordinary gravity hot water heating, with a rising main system of piping and cellar distribution. By connecting the flow and return connection with a by-pass, *b*, and having at point *c* a three-way cock, the amount of hot water to pass through the radiator can be regulated; yet the flow of water through the pipes remains the same. Hence, if the temperature of the water at the boiler rises it can be seen at once that some of the radiators are cut off, and, if the automatic regulation be good, the fire would at once be checked.

I call your attention to the fact that a three-way cock regulates in the exact proportion that it is open or shut, which is not the case with other valves, which give a less accurate regulation.

The regulation of the temperature with this system is therefore the best.

The following examples will illustrate how the pump work. Areas of main pipes and losses in temperature are dependent on the flow pipes.

Take, for instance, a central station which should supply 12,000,000 B. T. U., which should be divided equally between three points, each 1300 feet apart, a total of 3900 feet. The flow temperature at the end of this stretch should be 195 degrees F., and the return water temperature 140 degrees F. Hence we require $\frac{12{,}000{,}000}{55}$ = 220,000 pounds of warm water per hour with a temperature slightly above 195 degrees to be delivered into the system, and a velocity of about 4 feet per second; the following sizes of pipe are necessary:

The first stretch with 4,000,000 B. T. U., a main pipe 4 inches diameter.*

The second stretch with 8,000,000 B. T. U., a main pipe 5½ inches diameter.

The third stretch with 12,000,000 B. T. U., a main pipe 6½ inches diameter.

In the January, 1901, issue of *Mittheilungen aus der Praxis des Dampfkessel und Dampfmaschinen betriebes* is an article in which the central station hot water heating system of the Toledo Heating & Lighting Company of Toledo, Ohio, is described. In this article the losses are shown due to friction of hot water in a 1-inch pipe. These figures give such a smooth list for all except water at 212 degrees that I am prompted to accept the figures as being correct and the tests as accurate. The coefficients of friction are here shown to be somewhat less for hot water than those established by Weisbach for cold water. Applying these American coefficients to the above mentioned work, the entire line of 3900 feet would offer resistance equal to, say, 95 feet of water column, or, say, 43 pounds pressure, which, in view of the great distance the water is carried, is very small. To overcome this pressure a pump of 14 horse-power is needed, and if we assume the building to be 80 feet high, then the suction end of the pump is under a pressure of 37 pounds and the discharge end of 79 pounds.

Now, to figure the losses in temperature of the three lines of flow pipes: Assuming that the pipes are insulated with good covering, the coefficient of transmission being 5.7, we have the following losses:

	Degrees F.
For the first line	0.5
For the second line	0.7
For the third line	0.8
Total	2.0

Hence the water at the boilers must be delivered into the mains 2 degrees higher than it is wanted at the end.

If we wish to increase the system by two further extensions of 4,000,000 B. T. U. each, 1300 feet further from the central plant, making the total of 6500 feet of travel, and assuming the same velocity of 4 feet per second, the dimensions of the pipes would be:

For the first stretch of 4,000,000 B. T. U., a pipe of 4 inches diameter.†

For the second stretch of 8,000,000 B. T. U., a pipe of 5½ inches diameter.

For the third stretch of 12,000,000 B. T. U., a pipe of 6¾ inches diameter.

For the fourth stretch of 16,000,000 B. T. U., a pipe of 7¾ inches diameter.

For the fifth stretch of 20,000,000 B. T. U., a pipe of 8¾ inches diameter.

The frictional resistance would equal 130 feet of water column, and requires a 30 horse-power pump, which, with a building hight of 80 feet, would put a pressure of 37 pounds on the suction and 97 pounds on the discharge end of the pump.

The losses in temperature would be as follows:

	Degrees F.
The first stretch	0.51
The second stretch	0.72
The third stretch	0.80
The fourth stretch	0.97
The fifth stretch	1.08
Total	4.08

Hence the water as it enters the mains at the boiler must be at 198½ degrees F., if it is to reach the end of the main at 194 degrees. It may be well to remark at this point that it is possible to reduce these losses by incasing the flow main in a box containing poor conduct-

* The sizes 5½ and 6½ inches are regular stock sizes of pipe in Europe.

† In America, of course, it would be necessary to use commercial sizes of pipe, which in this case would be 4, 6, 7, 8 and 9 inches, respectively.

ing material; in which event the flow being surrounded by a comparatively warm atmosphere, the end temperature should be practically the same as at the beginning.

Now to compare a high pressure steam system with the above mentioned hot water system: If we assumo the distances and amounts of heat required to be the same, the size of steam and return pipes will be as follows:

The first stretch: steam pipe, 6¾ inches diameter; return pipe, 3½ inches diameter.
The second stretch: steam pipe, 6 inches diameter; return pipe, 3 inches diameter.
The third stretch: steam pipe, 5¼ inches diameter; return pipe, 2¾ inches diameter.
The fourth stretch: steam pipe, 4½ inches diameter; return pipe, 2½ inches diameter.
The fifth stretch: steam pipe, 4 inches diameter; return pipe, 2 inches diameter.

If we assume that the average temperature of the steam is 284 degrees, and the return water temperature is 176 degrees, and the flow temperature of the water in the hot water heating system is 194 degrees and return 140 degrees, both having equally good covering on the pipes, then the losses of temperature in the high pressure steam system are to the losses in the water system as 10 is to 9. Then we must not forget that, in

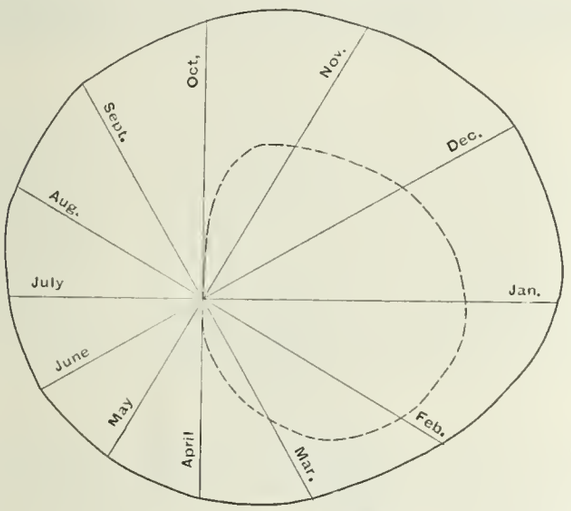


Fig. 4.—Outer Line Shows Comparative Amount of Fuel Used Each Month, and Inner Dotted Line Shows Comparative Amount of Heat Furnished.

milder weather, the difference in favor of the hot water system in this respect is very much greater.

I now will refer to a case where a single large building is to be heated with mechanical circulation. This calls for boilers, and a pump driven by electricity, the whole system to supply 8,000,000 B. T. U. The distributer in the boiler room has as its most difficult circuit one that is 650 feet long, which must supply 1,600,000 B. T. U. In this circuit the first branch is 360 feet distant, and supplies 160,000 B. T. U. There are in all ten such branches or points of distribution, spaced equally 32½ feet apart. In view of the fact that the motive power for the pump is electricity and comparatively expensive, it would be well not to assume too great a velocity in the mains; hence let us assume the moderate velocity of 3½ feet per second, and we get the following diameters of pipe necessary:

For the first stretch with 160,000 B. T. U., a pipe 7⅛ inches diameter.
For the second stretch with 320,000 B. T. U., a pipe 1¼ inches diameter.
For the third stretch with 480,000 B. T. U., a pipe 1½ inches diameter.
For the fourth stretch with 640,000 B. T. U., a pipe 1¾ inches diameter.
For the fifth stretch with 800,000 B. T. U., a pipe 2 inches diameter.
For the sixth stretch with 960,000 B. T. U., a pipe 2⅛ inches diameter.
For the seventh stretch with 1,120,000 B. T. U., a pipe 2¼ inches diameter.
For the eighth stretch with 1,280,000 B. T. U., a pipe 2½ inches diameter.
For the ninth stretch with 1,440,000 B. T. U., a pipe 2⅝ inches diameter.
For the tenth stretch with 1,600,000 B. T. U., a pipe 2¾ inches diameter.

The frictional resistance is equal to 25 feet of water column, and requires a pump with electro motor of only 2½ horse-power. For the riser pipes and radiator connections the velocity should be reduced to 1½ feet per second so as to avoid hammering or gurgling noises. With this velocity the following sizes of pipe are necessary:

Up to 20,000 B. T. U., ⅜-inch pipe is necessary
Up to 32,000 B. T. U., ½-inch pipe is necessary.
Up to 64,000 B. T. U., ¾-inch pipe is necessary.
Up to 120,000 B. T. U., 1-inch pipe is necessary.
Up to 180,000 B. T. U., 1¼-inch pipe is necessary.
Up to 240,000 B. T. U., 1½-inch pipe is necessary.
Up to 440,000 B. T. U., 2-inch pipe is necessary.

From this we can see that the sizes of pipes are very small, and that the first cost of pump and motor can be greatly offset by the lower cost of piping. Another, and greater, advantage is that the piping can in all cases be laid against or in the ceilings, as there is no necessity for a pitch in the piping. If we now add to these advantages the fact that radiators can be set on a level with, and almost any distance below, the boiler, and that the attention necessary is much less than in high pressure steam, the mechanical circulating hot water heating apparatus should commend itself for use in all administration buildings, &c.

I now turn to the question, To what extent can central station hot water heating be used to reclaim the heat lost in the larger steam plants? The arrangements for using much of the exhaust steam from engines are made in many approved forms. If the exhaust steam from an ordinary engine is to be used for hot water heating an ample water heater in which the water can circulate, but where condensing engines are used, as is generally the case now, surface condensers are best. As the temperature of the waste hot water increases the amount of vacuum in the condenser decreases, which naturally increases the fuel consumption of the engine.

To decide whether it would be better to choose a simple exhaust engine and use this exhaust steam for hot water heating purposes, or to use a condensing engine and heat with direct steam, or if it be better to use a condensing engine with only a partial vacuum at times, depends entirely on the time that the heating is to be done and when the greatest amount of work is to be done by the engine. Hence each case must be examined and figured separately.

To illustrate the approximate amount of fuel necessary I offer the following: An exhausting engine requires about 1.25 times the amount of fuel required by a condensing engine. Hence, if we take the amount of fuel used by a condensing engine per month = 1, then the amount of fuel used in n months = n 1, and that of the exhaust engine as 1.25 n, of the fuel heat necessary for an exhaust engine 80 per cent. can be used for heating purposes. Consequently 0.8 n = n of the fuel heat used. Whereby we would assume that the heating work being done is always the maximum. Inasmuch as the amount of heat necessary varies with each day, it is well to figure the average, which would be two-thirds of the maximum. Consequently the fuel necessary for a year would be $12 \times 1.25 = 15$, of which practically two-thirds is available for heating purposes. Now, if heating is necessary only six months of the year, and the amount of fuel used during the year is the same, then $2/3 \times 6 = 4$ of the entire fuel necessary, 15, or 26 per cent. of the fuel annually used is available for heating purposes. With a condensing engine of the same size used throughout the year and contemplating direct steam heating, the fuel necessary would be $12.1 + 2/3\ n$.

If, for instance, we figure on six months' heating, the cost of fuel would be $12 \times 1 + 2/3 \times 6 = 16$, as against 15 for the exhaust engine.

Now take the condensing engine used $12 - n$ months and the heating being done with a partial loss of vacuum, then the fuel necessary therefore is $(12 - n)\ 1 + 1.25\ n$, when we drop the necessary vacuum, or $12 + 0.25\ n$.

This goes to show that the plant with a condensing engine and direct steam heating, as compared with a condensing engine and using the condensed steam, is as $\frac{12 + 2/3\ n}{12 + 0.25\ n}$, which goes to show that the plant using a con-

densing engine and direct heating increases in expense as the heating season is lengthened, and in a six months' heating period the proportion is as 16 to 13.5. If we take into consideration that the condensing engine runs during the heating period with a partial, though small, vacuum and under better conditions than were assumed herein, it naturally increases its advantage when the waste steam is used for heating.

The largest plants in which the exhaust can be used to advantage are our electric lighting plants. An American, in an article in the *Street Railway Journal*, shows that the foresight of a prophet is not necessary to see how the heating and lighting of our cities is to be done in the future. According to him, the solution of the problem lies in the use of hot water that is sent from a central station over an area with a radius of 1½ miles to the advantage of the projectors and the satisfaction of the consumer. The credit for the first solution of this problem belongs to the Heating & Lighting Company of Toledo, who have supplied the city with heat and light during the past five years. This time is too long to consider it in the light of an experiment; it must be accepted as a commercial success.

At the time the central electrical station system was being introduced the demand for heat and light was about equal. In this new system electricity is becoming more and more a side product, as of the high pressure steam, which is necessary to drive the engines, only a small percentage of the heat is used, and 80 per cent. of the surplus heat is used in heating the city from the central station. Should an inventor offer to make electricity without cost he would certainly create a sensation. Yet this is what the Toledo Heating & Lighting Company have done, for during the six months ended January 1, 1901, the report shows that they heated 199 houses and lighted 450 houses. This is followed by a table showing an efficiency of 90 per cent., which seems to me an optimistic report, as I will show.

In the circular diagram, Fig. 4, is shown a monthly comparative amount of fuel used, and inside the same, in dotted lines, the amount of power used for heating purposes. The radiant lines show the months. These curves are both drawn to the same scale, and show that the amount of fuel necessary in summer for lighting is comparatively small, and that the requirements for light increase in about the same proportion as for heat. If we assume that under the best conditions in which a condensing engine can be used in connection with heating the fuel consumption cannot drop below 12, but must naturally rise, and inasmuch as during a six months' run the fuel consumption of a plant with condensing engine and direct steam heating = 16, therefore the saving of fuel in a plant using the waste heat from the condenser is $\frac{16-12}{16} \times 100 = 25$ per cent. Therefore, there can be no thought of the furnishing of electricity becoming a side product in electrical central stations.

Referring to Figs. 1 and 2, it will be seen that to prevent losses of vacuum, &c., through the condenser it would be necessary to store electrical energy during the day for night use and heat at night for use in the morning. The fact that losses will occur in the storage of electrical and heating energy would indicate that the 25 per cent. saving mentioned above would be very nearly wiped out. The attention necessary to properly handle the storage of heat and light would also add to the cost. Hence I do not believe that I am too pessimistic when I say that the use of condenser heat is hardly justifiable, and that I cannot understand how the operation of the Toledo plant can be so economical.

As soon as there is a demand for hot water heat only there will be found a way for utilizing this heat, or at least a part of it, by sending the return water through the condensers in the morning to raise the temperature as high as possible; then, with fire or live steam heaters, raise it to its proper light. The advantage in doing this is to not increase too much the cost of operating the engine.

Naturally there is some economy in using the waste heat, and this could be greatly increased if, say, during the summer it could be used for warming water for public baths and for domestic use. To bring this question to a proper solution, I would recommend to the trade to compare hereafter this hot water central heating system with any contemplated high pressure steam heating plants in the hope of using it and getting some reliable data.

It is my thought that conditions in America are different to what they are here; hence I warn our industries to be careful in following American ideas too quickly lest our industry be injured by it.

NOTE.—The discussion was very spirited both for and against, but all agreed that central station hot water heating is a subject worth all the time that can be applied to it.

New York City Notes.

The Bronx Branch of the Master Plumbers' Association of New York is rapidly increasing in membership and has been very successful so far in giving its members protection where needed. Its membership is now over 40. Secretary McEvily was a visitor at the meeting of Manhattan Branch last Tuesday evening.

* * *

The next meeting of the Greater New York Association will be held in Long Island City on Monday, January 13. All members of Queens Branch should keep in touch with what is done at this meeting.

* * *

Owing to the diversion of the different city departments under the boroughs by the new City Charter, it has been decided that plumbers' bonds must be taken out in the borough where the plumber is working, not from the Sewer Department, which is abolished, but from the office of the borough president. This may entail additional expense, but it will save a lot of time consumed by outlying plumbers having to come to Manhattan, and it should also keep the local officials in closer touch with the work going on.

* * *

No change has yet been made in the Examining Board of Plumbers. John Renehan, the president, is the only one whose term expires. The appointing power, the Mayor, will have to go a long way to find three more conscientious and painstaking examiners than the present board. They have been very busy for the past six weeks with the large number of applicants who have presented themselves for examination.

* * *

Among the busy plumbers not heretofore mentioned is John W. Cooney of 355 West Twenty-sixth street, who was the successful bidder for the new Macy department store on the block on the west side of Broadway, from Thirty-fourth to Thirty-fifth streets, of which the Fuller Construction Company are the builders. He is also busy with a 15-story apartment house at Madison avenue and Sixty-third street, and an office building at John street and Broadway, for the same builders. Besides the above mentioned work, Mr. Cooney has two private houses on Fifty-fifth and Fifty-sixth streets, near Fifth avenue.

* * *

The numerous friends of Henry J. Pattison, ex-national secretary under President John Mitchell, will be pleased to learn that he has secured a fine position as cashier to County Clerk Hamilton.

* * *

Among the other plumbers who have secured positions under the new administration is Michael Hecht of 697 East 155th street, who has been appointed Deputy Superintendent of Public Buildings by President Haffen of Bronx borough.

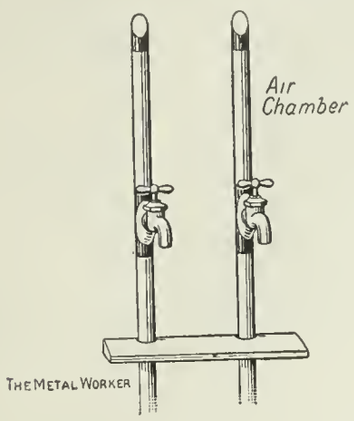
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Spelman & Co. are reported to have been the successful bidders on the new Astor apartment house, at Fifth avenue and Fifty-fifth street. As before mentioned, this will be one of the finest apartments in the city. The principal piping, fire lines, waste, vent, &c., are to be of brass, with the other materials corresponding.

SUPPLY PIPE AIR CHAMBERS.

BY HELMAR.

Faucets on plumbing systems supplied with water under a high pressure should be provided with air chambers to prevent the shock of "water hammer" and the attending destructive effect not only on the faucets, but on the pipes. Valves and some forms of compression faucets which necessarily close slowly do very well under low pressures without air chambers in cases when the waterway is small, the connection direct and the supply pipe relatively large, because under such conditions the velocity of the water in the supply is low and it is checked gradually. Reaction is greater as the pressure and velocity increase, and is the result of checking water in motion, and is caused by the water being practically incompressible.



Supply Pipe Air Chambers.—Fig. 1.—Air Chambers at Sink.

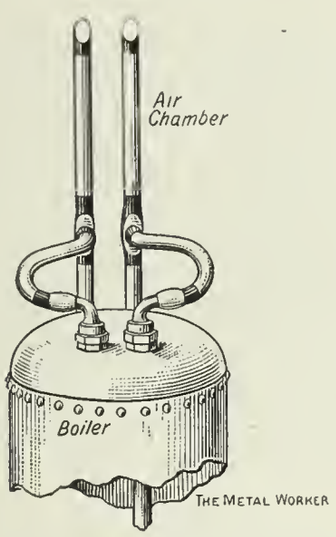


Fig. 2.—Air Chambers on Boiler Service Pipes.

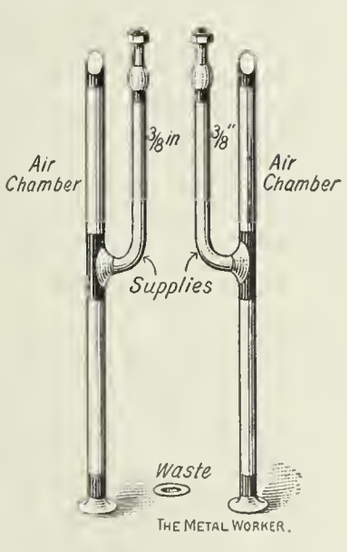


Fig. 3.—Air Chambers on Lavatory Supply.

In ordinary plumbing work air chambers should always be put in, because the pressure may be changed or different kinds of faucets substituted when those first put in are worn out. The ordinary chamber, shown in Fig. 1, is merely a continuation of the pipe into which the faucet is branched and ought to be at least 12 inches long, because the amount of air contained is small to begin with and some of it is absorbed by the water, leaving barely enough to cushion the motion of the water on fair pressure when one is placed over every faucet and made as long as good appearance or conditions will permit. They should always be placed as direct as possible, and those at the faucets may be supplemented by others placed over the boiler, at least 12 inches long, as shown in Fig. 2, and elsewhere as the design of the job suggests or permits.

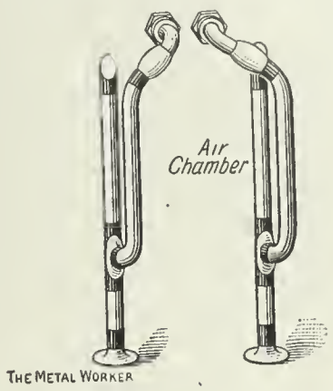


Fig. 4.—Air Chambers on Bath Supply.

On lavatory and bath supplies the coupling piece should always be branched into the supply proper and the supply continue straight up for the chamber, as shown in Figs. 3 and 4.

Where simple supplies continue from the sink to bath or other fixtures above, bulb air chambers, as shown in Fig. 5, are sometimes made by wiping on a piece of 2-inch pipe above the faucet and letting the bathroom supply pipe extend downward inside of it from the upper end to near the bottom. The bathroom stop and waste cocks should always be placed above these chambers.

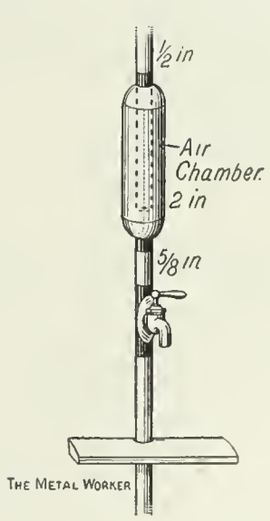


Fig. 5.—A Bulb Air Chamber.

JAMES BOWMAN died at his home, 1402 Sheffield street, Allegheny, Pa., on December 27 after an illness of two weeks, aged 53 years. Mr. Bowman was born in Allegheny, and a number of years ago entered the new plumbing firm of Bridge & Bowman. On its dissolution Mr. Bowman continued the business alone. He was an official member of the Union Methodist Church and a prominent Mason and Odd Fellow. He is survived by his wife and one sister.

ASSOCIATION NEWS.

Northwestern Association of Master Plumbers.

A call has been issued by President F. R. Dengel of the Wisconsin State Association of Master Plumbers for the annual meeting, which is to be held in Milwaukee on January 14 and 15. It is said that over 700 invitations have been issued to plumbers in the five principal States which constitute the Northwestern Association, to meet in Milwaukee at the close of the Wisconsin State Convention, on January 16, 17 and 18. The principal discussion at the State gathering, it is understood, will be on the question of the agreement with the manufacturers in regard to the sale of plumbing material. The Northwestern Association consists of members from the States of Wisconsin, Iowa, Illinois, Minnesota and Montana,and has been in existence about five years. In view of the fact that no agreement now exists between the plumbers and the manufacturers, this meeting in the city of Milwaukee, the home of Charles Polacheck, the vice-president of the National Association of Master Plumbers, may have special significance, inasmuch as E. D. Hornbrook, president of the National Association of Master Plumbers, has recently issued an official list of the membership of his association.

Pittsburgh Master Plumbers.

The annual meeting of the Master Plumbers' Association of Pittsburgh and vicinity was held on January 8, and the following officers elected for the ensuing year:

President, S. S. White.
Vice-President, C. S. Craig.
Treasurer, Frank McKnight.
Secretary, George Sands.
Sergeant-at-Arms, M. Purtill.
Executive Committee: John M. Addy, M. Counahan, W. N. Sauer and Max Snively.

Cincinnati Master Plumbers.

The annual meeting of the Master Plumbers' Association of Cincinnati, Ohio, was held on January 2, when the following officers were elected for the ensuing year:

President, J. B. Lauman.
Vice-President, M. J. Cash.
Secretary, Robert Kieserling.
Treasurer, William Donohue.
Directors: Charles Naunce, John Story and W. F. Wayne.
Sergeant-at-Arms, Thomas Lynn.

After the election a dinner was served at the Victor Café, Thomas Canary acting as toastmaster and performing his duties in a happy manner.

Those present were: Julius Hengstenberg, J. B. Lauman, William Donohue, William Wagner, Joseph Lawson, M. J. Cash, T. Lynn, Clifford T. Schlemner, Ray J. Hillenbrandt, Thomas Canary, Richard Murphy, John Simon, William Attlesey, Charles Botley, William Warner, Louis Kronse, George Kieswetter, Frank Noonan and Henry Niemes.

Brooklyn Master Plumbers.

The annual meeting of the Brooklyn branch of the Master Plumbers' Association of New York City was held on January 3 with a large attendance of the members. The reports of the various officers showed the association to be in a flourishing condition. After the transaction of the regular business the election of officers was taken up and the following were elected for the ensuing year:

President, Dennis Donegan.
Vice-President, William M. Brown.
Financial Secretary, Charles Schwenker.
Recording Secretary, Samuel Corcoran.
Treasurer, Louis Gfroerer.
Sergeant-at Arms, John Moyles.
Marshal, Herbert Wilkes.
Trustees: George W. Smyth, E. S. Kelly and William Biermann.

Montreal Master Plumbers.

The Master Plumbers' Association of Montreal, Canada, held their annual meeting recently in the rooms of the Liberal Contractors' Club, in that city. The attendance was large. The annual reports were read, followed by the election of officers. The following were elected for 1902:

Honorary President, John Date.
President, Thomas Moll.
First Vice-President, Thomas O'Connell.
Second Vice-President, Joseph Thibault.
Third Vice-President, W. G. Graham.
Secretary, J. A. Gordon.
Financial Secretary, J. C. Brunet.
Treasurer, Captain Giroux.
English Corresponding Secretary, J. W. Hughes.
French Corresponding Secretary, Alderman Joseph Lamarche.
Chairmen of Committees: Sanitary, P. C. Ogilvie; Auditing, J. A. Watson; Apprenticeship, P. J. Carroll.

Australasian Master Plumbers.

At the annual meeting of the Master Plumbers' Association of Otago, New Zealand, held October 18, considerable interest was evinced in the reports, which showed the association to be in a flourishing condition. The following officers were elected: John Scott, president; H. A. Ross and A. Burt, Jr., vice-presidents; T. Walker, treasurer, and T. Christie, H. Renfree and R. Scott, Executive Committee. The newly elected president has also been appointed to a seat on the Drainage and Sewerage Board of Dunedin, New Zealand. The association agreed to make it a rule that apprentices must attend the technical school classes until they qualify themselves to pass the city and guild examinations of London.

At the annual meeting of the Master Plumbers' Association of Victoria the following officers were elected: J. K. Johnston, president; M. A. Horne, vice-president; Charles Shuell, secretary; J. Alexander, financial secretary; J. Wood, treasurer. In addition to the above named, F. B. Brady, W. Walsh, W. Cash, George Fountain and William McKerow form the Executive Committee.

The P. & S. S. League.

The bowling games in the Plumbing and Steam Supply League tournament were resumed on Monday night at the Monarch alleys in New York. The Salesmen team are forging to the front, having taken the H. P. Read Lead Works and the Ronalds & Johnson Company, New York, teams into camp with the good scores of 728 and 796. The Read team lost both their games. The feature of the bowling on Thursday night was the scoring of their first winning game by the E. F. Keating team. Of course it had to come some time, and as a result the Thomas G. Knight team lost two games, for the invincible family team of Behrer & Co. won both their games, which put them even with the leaders in the tournament—the team of the John Simmons Company—both having won 8 and lost 2 games.

The business heretofore known as Fleck Brothers, dealers in Plumbing, Gas and Steam Goods, with chief office and store at 44 North Fifth street, and branch store and warehouse at 1641-1645 American street, Philadelphia, Pa., and of which the officers were H. H. Fleck, president, and George C. J. Fleck, secretary and treasurer, was on January 2 dissolved, and succeeded by Fleck Brothers Company, Incorporated, who will, in the future, conduct the business as heretofore at 46 to 50 North Fifth street, Philadelphia, Pa. There will be no change in the policy or management of the new company.

The contract for plumbing the new Court House at Rhinebeck, N. Y., has been awarded to Bannon & Co., Rondout, N. Y., at their bid of $9492.

THE INFLUENCE OF OUTER WALLS ON RADIATION RULES.

BY A. TEE.

Everything that I have ever seen in print designed to assist those who must decide the amount of radiation necessary for a building I have read with a great deal of care. The rules presented in *The Metal Worker* recently for greenhouse work compare favorably with those I use and have proved in practice. However, it is for residence heating particularly that rules are most needed. In many respects the custom of the tailor measuring a man for a suit of clothes could be followed with advantage by the heating contractor. The tailor not only measures his man to get his size, but also examines him to find whether he is full or hollow chested, whether the suit will have to be padded a bit to fill out and keep him warm, and whether he wants his coat to button well up in front, or whether he is going to wear it open all the time.

Some time since a man sent a plan of his house in the country to a contractor to know what it would cost to heat it. The plans with dimensions were all the contractor had to guide him, and he figured liberally, in his opinion. Then, as the work to be done was at a considerable distance and he was busy, he advised that the work be given to some local contractor, if one could be found to take it.

EXPERIENCE EXPANDED THE RULE.

Such a man was consulted. This man had been in the heating business many years and was familiar with the character of buildings in his locality, and after seeing the building agreed to do the work at the price that had been named, but would not guarantee the work. This brought the customer back to the original contractor, who also had had a wide experience. The statement that the man who had been on the spot and seen the building would not guarantee the heating of it with the liberal apparatus which he had laid out led the original contractor to question the owner as to the character of the building, when it was found that it was an old building, lathed and plastered on the inside, and with thin weather boarding on the outside nailed directly to the studding. Immediately the original contractor saw his error, and he at once told the customer that the rule he followed in such a case would be to multiply the amount of radiation that he had previously considered necessary by two, and to provide a boiler capable of supplying an increased amount of radiation, the price being advanced in proportion. The plant installed on these lines proved satisfactory.

THE VALUE OF A RULE.

This brings up the point that any rule for figuring radiation is valuable in proportion to the judgment that is used in applying it. For the man who is taking up heating as a new branch of his business the best rules that he can get are only guides, but after he has had experience their value is increased. A rule is only made to be strictly adhered to by those who have not the knowledge of the business which will enable them to depart from it when it is necessary. Almost all rules for calculating radiation are intended for application on buildings so constructed that they will retain the heat that is provided within them. An ordinary 9-inch brick wall which is stripped so as to leave an inch or so of air space between the wall and the lath and plaster is the type of a wall generally considered. Walls of that kind will not retain heat much better than frame constructions which have their studding covered with good sheathing to which building paper is fastened before the weather boarding to make the finish is nailed on.

WALL CONSTRUCTION GOVERNS THE RADIATION NECESSARY.

In some instances little attention is paid to the character of the sheathing. Shaky, warped lumber full of season cracks and knot holes, with crooked edges, is often applied, no care being taken to make it fit close together, and to cover the building up tight. As little care is taken in the selection of the building paper and in applying it. In consequence when thin weather boards are used and they warp or spring a little, there is nothing to hinder the air going under the boards and paper through the sheathing until the cold air comes directly in contact with the thin coat of lath and plaster. Such a house is almost as hard to heat as if no sheathing was used, and it will require a great deal more radiation in it than a house of the same size that is carefully built. Those who do heating work cannot pay too much attention to finding out the character of the construction of the buildings which they are called upon to heat, particularly if they are old buildings or of cheap construction. They will save themselves many complaints and much trouble if they point out to the owner that such buildings will not retain heat and apparatus that furnishes a larger amount of heat must be provided when they figure on work. After they have learned the character of the building they will do well to provide liberally, both as to the boiler and the amount of radiation for heating the house.

THE PROVISIONS OF A GOOD RULE DOUBLED.

An instance of this character comes to mind, where an engineer laid out a system of heating, with a boiler supposed to have a sufficient capacity and with ample radiation. This proved insufficient, and after two years a size larger boiler was used without overcoming the difficulty. Finally, the owner came back to the engineer and in conversation it was found that the old building had no sheathing under the weather boards, which were old, cracked and somewhat loose. The engineer asked the question why that information had not been given to him in the first place. The plant was remodeled with a boiler double the original capacity and twice as much radiation, after which the owner expressed himself as perfectly satisfied with the service secured.

If the heating contractor will be careful to learn something of the building which he has to heat before he attempts to heat it, he will have less complaint as to the value of rules and better success from his work. Advantage will attend the practice of applying any rule to the room that common sense will decide is the easiest to heat and increasing the provisions of the rule in proportion to the difficulty that will be discovered in the rooms that will naturally need more heat. All rules increase in value with the knowledge of the conditions surrounding the result to be accomplished and the care with which the rule is applied to meet them. Examine the building, study the rule, then apply common sense. If your price is too high explain to your customer. If he won't listen, let the other fellow have the job and watch the result.

Heating and Plumbing Notes.

The Brooklyn branch of the Association of Master Plumbers of the city of New York has appointed George W. Smyth, M. F. Gleason, H. M. Noble, William M. Brown, J. A. H. Ebel, E. S. Kelly, W. J. Piercy, Jr., and Edward Macdonald as the committee in charge of the annual entertainment and reception, which will be held at Schwaben Hall, corner of Knickerbocker and Myrtle avenues, on Tuesday, January 21. The committee have favored *The Metal Worker* with tickets for the entertainment, which they say will not only duplicate past successes, but improve upon them. The invitation which the committee are sending out contains a special invitation to the ladies. The letter also gives the various street car lines by which the hall can be reached.

The Rhode Island Supply & Engineering Company are doing the piping in the boiler and engine house of the new plant of the Eastern Bolt & Nut Company, at East Providence, R. I.

C. F. Young, formerly in the Philadelphia office of the United States Heater Company, has been transferred to their new York office to assist the manager, W. S. Newkirk.

A fire visited the plumbing establishment of J. W. Bennett, at Haddonfield, N. J., on December 28.

F. E. McCormack & Co of Lestershire, Pa., have the contract for the plumbing and heating plant for the new Opera House, at New Milford, Pa.

R. G. Parsons, secretary of the Board of Public Works of Buffalo, N. Y., will receive bids until January 9 for the heating and ventilating system in the new Lafayette High School Building in that city.

The Climax Acetylene Gas Machine forms the subject of an illustrated folder that is being distributed by the New Process Mfg. Company, Dallas, Texas. A feature of the circular is a lengthy list of names of satisfied users of this machine. The company are prepared to make estimates on piping and fixtures for acetylene gas for any class of buildings.

The Universal Sanitary Supply Company of Newcastle, Pa., are about to double the capacity of their plant. There are now four kilns at the plant, and it is the intention of the company to have eight kilns in operation as soon as they can be completed. The company now employ 125 men making Sanitary Earthen Ware.

The Examining Board of Plumbers of Utica, N. Y., organized on January 2, with John P. Shaughnessy as chairman; John Broz, treasurer; James F. Cahill, chairman of Finance Committee, and T. W. Fogarty, clerk.

Robert Scott of Philadelphia has the contract to install a $10,000 steam heating apparatus in the new printing house of Stephen Greene in that city. He also has the contract for heating St. Vincent's Home.

Edward Mahl, Hartford, Conn., has the plumbing contract and Libby & Blinn the heating contract for the addition to the Moseley Building in that city.

The contract for plumbing the new Auditorium which is being erected on College street, New Haven, for Yale University, which will amount to $6000 or $7000, has been awarded to Thomas W. Corbett. The heating will be done by the Walworth Construction & Supply Company of Boston, Mass.

An engraved card received from Boston, Mass., bears the inscription, "The Gurney Heater Mfg. Company Extend the Compliments of the Season. Boston, January 1, 1902." This card has been sent to those who handle Steam and Hot Water Heating Apparatus throughout the country.

The Southington, Conn., Water Company are making arrangements for extending their water mains to Milldale, which will require about a mile of 6-inch pipe and involve an expense of about $4500.

The C. J. McCurrin Company, 432 Tenth street, N. W., Washington, D. C., dealers in Plumbers,' Gas and Steam Supplies, are sending out a large wall calendar for 1902 with the monthly sheets 24 x 36 inches in size and the numbers 2¼ inches high. The space above the calendar bears the address of the company and calls attention to the character of goods which they handle.

W. B. Arnold & Co. of Waterville, Maine, have been awarded the contract for heating the new City Hall at that place, their bid being $2700, which was the lowest of five. The Carman-Thompson Company of Lewiston bid $2048 and secured the contract for the plumbing work.

The ordinance of 1892 requiring the plumbers of Chicago to pay a license fee having been declared unconstitutional by the Supreme Court last June, has resulted in the bringing of 400 suits against the city to recover fees paid. Three hundred cases have been tried and judgments secured aggregating $20,000. The judgments range from $40 to $150.

P. C. Antonides, Albany, N. Y., has moved his plumbing shop from River street to the Richtmyer Building on Reed street.

The plumbing trade will congratulate John Campbell of Paterson, N. J., on the honors conferred on him by the Paterson Caledonians on his retirement as Chief of Clan. He has been at the head of his clan at gatherings in various cities in the United States and at Glasgow last year, as well as at numerous Highland games. His portrait in costume is highly prized by many friends of Scotch extraction.

William L. Whipple, Providence, R. I., who has been seriously ill for several months, is again at the plumbing shop, at 47 and 49 Manton avenue. He reports business to be fairly good, and as the large mills in the section of the city in which he is located are running full time, he confidently looks for a brisk spring trade.

The National Association of Master Steam and Hot Water Fitters announce that manufacturers and dealers on their "list in accord" are extended the privilege of furnishing their catalogues to be kept on file at the National headquarters of the association, 260 West Broadway, New York City.

Frank G. Du Bois, a certified public accountant, has opened an office at 100 Broadway, New York City, in addition to his office, 102 Heller Parkway, Newark, N. J. Mr. Du Bois is well known to the plumbing and heating trade, both wholesale and retail, and is prepared to assist in putting their books in order at this season, when settlements are being made.

W. H. Zech, Reedsburg, Wis., reports a good year in the plumbing and heating business. A year ago he purchased the business from John G. Schuster, who has since been conducting a similar business in Denver, Col.

R. C. Bartley & Co., Bartley, N. J., manufacturers of the Favorite Heater, expect to enter their new building on May 1. It was actually finished two months ago, but delay is caused by the dam from which power will be derived not being ready. The new works will have more than three times the capacity of the old, the latter being altogether inadequate to meet increasing business.

J. P. Rundle of the Rundle-Spence Mfg. Company of Milwaukee, Wis., retired from the company on January 1, selling his interest to William Spence, who has assumed entire charge of the business and will continue to manufacture a varied line of Plumbing Goods.

Ward McLean of Brooklyn, N. Y., died at Walters Park, Warnersville, Pa., on Monday, January 6. He had been unwell and went to Warnersville for the benefit of his health. Mr. McLean was 81 years of age and was born in New York City. He was connected with the McLean Engineering Company, steam and electrical contractors and constructors, of New York. He is survived by his wife and three sons.

Michael Dore died at his home, on Third street, Waterford, N. Y., December 29, at the age of 54 years. About 15 years ago he embarked in the plumbing and housefurnishing business on Fourth street, where he remained until the time of his death. He was a member of St. Mary's Church and of the Knights of Columbus. Mr. Dore is survived by his wife, two daughters and one son.

The W. B. Hubbard & Son Company have been incorporated at Boston, Mass., with a capital of $65,000, to do a Plumbing Supply business. The directors of the company are William B. Hubbard, Frank W. Hubbard and Wallace R. Hubbard.

The new law regulating the plumbing business in Seattle, Wash., went into effect on January 1. All plumbers carrying on business must now pass an examination and secure a license. The local Board of Plumbing Examiners consists of Dr. Gibson, who is president of the Seattle Board of Health; James McIntyre, City Plumbing Inspector; James Stock and John Manoway, master plumbers, and Robert Simpson, Journeyman plumber. The fine for doing plumbing work without a license is $50.

James H. E. Greene died at his home in Worcester, Mass., on January 2, after an illness of several months. He was 54 years of age and conducted a plumbing business at 343 Pleasant street. Mr. Greene is survived by his family and his brother, John H. Greene, who is engaged in the plumbing business at 20 Lincoln square.

F. A. Warburton of Port Gibson informs us that he has opened a branch of his plumbing and tinning business at Fayette, Miss., where a new water works system and an electric lighting plant are now being constructed.

Charles Van Stone, for many years with the Walworth Mfg. Company, of Boston, resigned his position and intends to embark in the manufacturing business for himself in the near future. He has already secured facilities at L and First streets, Boston.

In the District Court at Austin, Texas, on January

7, several members of the Master Plumbers' Association of Texas pleaded guilty to violating the anti-trust law and confessed judgment to the sum of $1400 for penalties. The cases against 33 other members who were parties to the original suits were dismissed for the lack of evidence.

New Firms and Changes.

The Detroit Separator Company have been incorporated at Detroit, Mich., with a capital stock of $15,000, by James C. McGregor, James E. Foley, David E. Austin, A. M. Kerr and Hugh Brodie, to manufacture and sell Steam and Water Appliances.

R. V. Edel has resigned his position with the United States Heater Company, and has opened an office at 62 Broad street, New York City, where he will make a specialty of designing heating plants and making plans of heating systems for architects, builders and steam fitters, and preparing specifications for installing the work. Mr. Edel has been with the United States Heater Company for a number of years and designed the heating system for the City Hall, Birmingham, Ala.; for St. Austin's School, at Salisbury, Conn.; the Hamilton Building, Hackensack, and the Franklin Building at Rutherford, N. J., besides those for many private residences, churches, halls, and all kinds of buildings.

The Hawkeye Heating & Plumbing Company of Des Moines, Iowa, have been incorporated with a paid in capital of $6000 by T. J. Shea, C. J. Salin and Fred. Jackson. The company will install heating and plumbing systems, and manufacture Heaters and Plumbing Supplies.

The Union Plumbing Company have been incorporated at Atlanta, Ga., by Charles Whitefoord Smith of De Kalb County; Charles M. Roberts, John Woodside and G. N. Kellogg of Fulton County; A. I. McPherson of Jefferson County, Ky., and H. F. Thompson of Hamilton County, Ohio.

The firm of James & Gates, 156 Fifth avenue, New York, representatives of the Novelty Iron Works of Canton, Ohio, have been dissolved by the withdrawal of H. T. Gates. I. G. James will continue the business and look after the interests of "Our Own" line of Steam and Hot Water Heaters in New York and vicinity.

The firm of Miller & Johnston, Fall River, Mass., have been dissolved, Nathan Miller, the senior member of the firm, retiring after an association in the business of 15 years. Mr. Miller has secured quarters at 155 Pocasset street, where he will conduct a steam and gas fitting business.

The New Century Heating & Appliance Company have been incorporated under the laws of New Jersey, by Thomas L. Jones, W. K. Burton and T. W. Beach, all of Memphis, Tenn., with a capital of $1,000,000, to manufacture Heating Apparatus.

J. W. Roberts, founder and largest stockholder of the Parkersburg Supply & Plumbing Company, Parkersburg, W. Va., has disposed of his controlling interest in that concern to one of his former partners, R. C. Smoot, and T. W. Starbuck. Mr. Roberts retires to give his attention to more important interests. Mr. Smoot has for several years been manager of the business, and his ability in this line is well known. Mr. Starbuck has had invaluable experience in the same business here and with large concerns in New York City. Under the control of these two experienced men the large and prosperous business of the plumbing company will undoubtedly maintain the reputation attained in the past.

The Carnegie Steel Company have posted notices at their Duquesne Steel Works forbidding interference with employees because of religious or political beliefs, and stating that employees will be discharged for failure to pay their bills. Some of the rules posted are as follows: "1. No interference shall be permitted with the civil, religious or political opinions of any employee, and no political notices shall be posted in the works. 5. Any employee who is arrested for a criminal offense and leaves his position vacant thereby will be discharged. 6. Any employee who habitually neglects and refuses to pay his bills will be subject to discharge. 8. All superintendents and foremen must pay strict attention to the rights and privileges of the employees, and whenever a vacancy occurs the employee of long service and in the line of promotion must be selected, regardless of his political or religious belief, providing he is able to fill the higher position." The other rules are relative to the care of machinery and the conduct of employees. Rule seven states that the use of intoxicating liquors while on duty is forbidden and renders the user liable to discharge.

The Polytechnic Association of the American Institute.

The Polytechnic Association, a section of the American Institute, meets each Thursday evening from January 2 to February 13, in the hall of the institute, at 19 West Forty-fourth street, New York, from 7.30 to 9.45 p.m. All persons engaged or taking interest in any branch of useful arts are invited to attend these meetings and to take part in the discussions, admission being free. The regular subjects for discussion are as follows:

January 9, "Disintegrating."
January 16, "Explosive Engines."
January 23, "Springs."
January 30, "Street Corner Signs."
February 13, "Submarine Vessels."

Exhibitions and descriptions of inventions, displays of specimens of manufactures or materials and miscellaneous practical, mechanical and chemical questions will occupy the time from 7.30 to 8.30, the stated subject for discussion following. Manufacturers or inventors who believe that their machines or products are not sufficiently appreciated are invited to introduce them for discussion in order to diffuse a knowledge of their merits. Arrangements to this end can be made by communication with George Whitfield, Jr., secretary, 19 West Forty-fourth street, New York.

TRADE NOTES.

M. J. Gleason will, it is reported, build a Brass foundry in Richmond, Ind.

The Euclid Mfg. Company of Palmyra, N. J., have been incorporated with a capital of $25,000, to manufacture Refrigerators. Robert Brooke, Harry E. Bell, Louis Krause and Vivian F. Gable are the incorporators.

The Peerless Metal Mfg. Company have removed their offices from the Bank for Savings Building to 1010 Park Building, Pittsburgh, Pa.

Joseph T. Ryerson & Son, Iron merchants and agents, of Chicago, are erecting, in the western part of the city, new warehouse buildings, which will occupy a space 250 feet square. This addition to their present facilities will give the firm a storage capacity of about 125,000 tons of Iron and Steel products.

The Storrs Mica Company of Owego, N. Y., were incorporated on December 27 at Albany, N. Y., with a capital stock of $125,000.

The New Jersey Metal Company of Salem, N. J., have been incorporated with a capital stock of $10,000 by Edward C. McHenry, S. B. Dance and Sam W. Groome to manufacture Metal Caps for jars, &c.

A. L. Eccles Company, manufacturers' representatives, have leased offices in the Graham Building, 127 Duane street, New York. A stock of Hardware, Machinery, Mill and Railway Supplies will be carried by them in their warehouse in Front street. They are now representing 14 manufacturers of specialties in Machinery, Hardware and Tools, illustrated catalogues of which will be sent on application. Alfred L. Eccles, for a period of 30 years was associated with the American Saw Company, Trenton, N. J., which plant was recently purchased by John A. Roebling's Sons Company, Henry Disston & Sons, Philadelphia, having succeeded to the Saw business. James L. Neefus, for about 20 years, has at different times represented the concerns of C. E. Jennings & Co., J. C. McCarty & Co. and Alder & Boyd as city and export salesman.

PATTERN FOR SCALE SCOOP.

(Without allowance for lap.)

Almost every tinsmith is called upon once in a while to make a scale scoop with a funnel on one end. In Fig. 1 are shown the side view, section and radii of such a scoop. To make the pattern for this a correct side view of the scoop should be made, as follows: Draw any horizontal line, as L M. At right angles to L M draw the line B D, and make the distance 4 to D the same as 4 to B, then locate the points A and C, and draw lines A to B, B to C, C to D and D to A. Place the tube G H I J, as shown, and at pleasure draw the curve F K E. Then will J D E K F G be the side view of the scoop. Now with a radius equal to 4 B or 4 D and N on the line L M as center describe the circle R P O M, which will represent a section through the line B D in side view. Divide the half circle O P R into equal spaces, as shown by the small figures 1 to 7, and from which, parallel to L M, draw lines intersecting the line B D from 1 to 7, as shown. From points 1 to 5 on D B draw lines to the apex C, while from points 5 to 7 draw lines to the apex A. Where the radial lines 2, 3 and 4 intersect the curve K E, draw at right angles to L M lines intersecting the bottom of the scoop D C at 1′, 2′, 3′ and 4′. In similar manner where the radial lines 5, 6 and 7 intersect the curve K F draw lines at right angles to L M, intersecting the scoop line J D at points D, 6′ and 7′. For the pattern for one half of the scoop K E D take C D as radius and C in Fig. 2 as center and describe the arc 5 5. Draw the radial line C 1. The scoop on the line K D in Fig. 1 has only a part of the circle for its profile, as shown from 5 to 5′ in section, Fig. 1. Take the stretchout from 1 to 5 in the section and place it on either side of the point 1 in Fig. 2, as shown from 1 to 5. From these

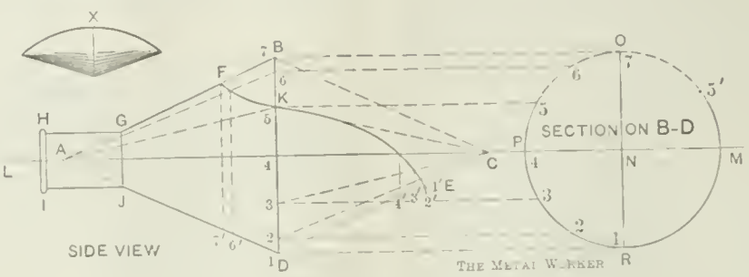


Fig. 1.—Side View, Section and Radii.

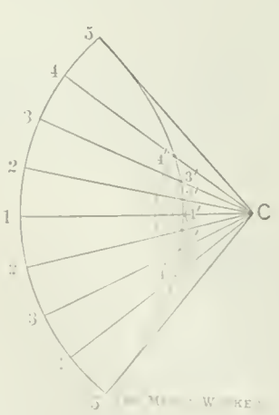


Fig. 2.—Pattern for Half Scoop K E D in Fig. 1.

small figures draw radial lines to the center C, as shown. Now with radii equal to C 4′, C 3′, C 2′ and C 1′ in Fig. 1 and with C in Fig. 2 as center intersect radial lines having similar numbers, as shown by 4′ 4′, 3′ 3′, 2′ 2′ and 1′ respectively, as shown. Trace a curved line through intersections thus obtained, as shown, from 5 to 1′ to 5, which completes the pattern. If a scale scoop were desired of a shape similar to X in Fig. 1 a duplicate of the pattern shown in Fig. 2 would be required and joined on the line K D in Fig. 1.

For the opposite half of the scoop G F K D J, take A D as radius and with A in Fig. 3 as center describe the arc 7 7. Draw any radial line, as A 1, and set off on either side of point 1 the stretchout of the semicircle R P O in Fig. 1, as shown by the small figures 7 to 1 to 7 in Fig. 3. From points 5, 6 and 7 draw radial lines to the center A. Now with radii equal to A 7′ and A 6′ in Fig. 1 and A in Fig. 3 as center intersect radial lines having similar numbers, as shown by 7′ 7′ and 6′ 6′. Trace a line through points thus obtained, as shown from 7′ to 5 and 5 to 7′. Now with radius equal to A J in Fig. 1 and with A in Fig. 3 as center describe the arc J J. Then will J 7′ 5 1 5 7′ J be the desired pattern. Allow



Fig. 3.—Pattern for Half Scoop D K F G J in Fig. 1.

edges to all patterns for wiring and seaming. The tube shown by H G J I in Fig. 1 should have a wired edge at H I, as shown.

The Amalgamated Association.

A call has been sent out for the next annual convention of the Amalgamated Association, to be held in Wheeling, W. Va., on April 15. As the secretary-treasurer is required to furnish sublodges with the programme six weeks before the convention meets, consequently all suggestions for the programme must be in the secretary's possession before February 17, 1902, or they will not appear. Delegates must be elected at the first regular meeting in March, and their names be sent to the national office. The convention this year will probably attract less attention than usual, for the reason that the strike last summer caused the loss to the Amalgamated Association of a very large number of mills and greatly decreased the strength of the organization. It is probable that strenuous efforts will be made to build up the organization among the mills of the United States Steel Corporation, but it is not believed that much headway can be made in this direction. The mills that were made nonunion during the strike last summer will very likely continue so. The Amalgamated Association is also very likely to be conservative in the matter of asking advances over present wage rates, as there will be no desire on their part to engage in another conflict.

Ninety Years Old.

The old established and popular tin plate and metal house of Bruce & Cook, New York, are sending out their usual New Year reminder to their customers and friends in the shape of the familiar calendar bearing exterior views of their office and warehouse buildings, surrounded by the monthly date tables and a list of the extensive line of goods handled by the firm. The calendar has not varied in form from the time it was first issued 28 years ago, and its annual appearance is as that of an old friend. An interesting feature of the present issue is that it marks the ninetieth year of the existence of the house, the business having been founded by the late John M. Bruce as far back as 1812. Age with them, however, does not spell decrepitude, for the concern were never more virile and progressive than at the present day. Their many friends all over the country will join with us in heartily wishing Bruce & Cook many more years of prosperity and success.

Accompanying the calendar is a large four-page circular, on the front of which is presented the firm's New Year greeting, with their annual message to the trade. Referring to the outlook for 1902, they say: "In our estimation, the prices which are ruling at the present time are as low as can be reasonably looked for on all kinds of metals for some time to come. The condition of the steel market would seem to warrant higher prices for this product in the near future. The very large demand for steel product, the inability of the railroad companies to handle promptly the enormous traffic, indicates that the country is still in a very prosperous condition, which appears likely to continue during the present year."

The rest of the circular is devoted to a list of all the goods handled by the firm and also of some of the principal items which they have in stock in New York ready for immediate shipment, including coke tin plates, taggers iron, roofing plates, Allaway and Melyn grade charcoal plates, black and galvanized sheets, polished steel sheets, American planished iron, genuine Russia iron, market wire, solder and sheet zinc. A list is also given of coke tins which can be shipped promptly from the mills in the Pittsburgh district.

Drawback on Stamped Steel Ceilings.

Under date of December 30, O. L. Spaulding, Assistant Secretary, has rendered the following decision:

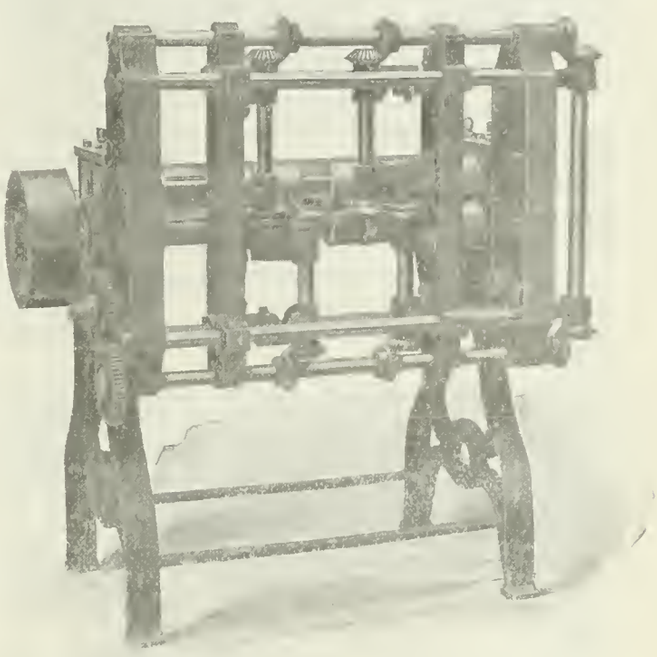
On the exportation of stamped steel ceilings, in which term are embraced coverings for side walls as well as ceilings, and all kinds of moldings, cornices, friezes, rosettes and other decorative designs, manufactured by Henry S. Northrop of New York, wholly with the use of imported steel sheets, by the processes of trimming and stamping or embossing, to which afterward may be added a thin coating of paint, a drawback will be allowed equal in amount to the duty paid on the imported steel used, less the legal deduction of 1 per cent.

In liquidation, the weights of imported sheet steel of the several gauges which may be taken as bases for allowance of drawback may equal the net weights declared in the drawback entry, after official verification; provided that in case any of the merchandise has been painted, 6 per cent. of its net weight shall be deducted therefrom to find the actual weight of steel exported.

THE recent incorporation of the William B. Scaife & Sons Company, under the laws of New Jersey, with a capital stock of $850,000, was made in order to convert the copartnership heretofore existing into a stock company, to increase the capital and extend the operations of the concern. The principal interest in the company, which at present is held by William B. Scaife, Jr., C. C. Scaife and C. C. Scaife, Jr., will continue in the incorporated company. The concern are one of the oldest in their line, having been established just 100 years ago. They do a wide range of business in the line of Architectural Iron Work, Sheet Iron, Range Boilers, Air and Gas Pressure Tanks and various specialties.

Automatic Sheet Steel Edging Machine.

The automatic sheet steel edging machine of which an illustration is given herewith has recently been patented, and is now being manufactured by the Canton Machine & Mfg. Company, Canton, Ohio. The machine is especially designed for edging galvanized sheets used in the manufacture of corrugated and plain conductor pipe in all the standard sizes, and of any length. It is described as swift in operation, and is claimed to do four times as much work as any other similar machine. Moreover, it only requires the labor of one person to feed the sheets to the machine. The machine is substantially constructed of the best materials. All the gears are cut, and working parts made from the best tool steel. Its



Automatic Sheet Steel Edging Machine.

capacity is guaranteed to be 100,000 feet per working day of ten hours, and it will edge iron No. 26 gauge and lighter.

A New Sheet Metal Working Firm.

Beseman & Bostwick are a new firm in the roofing, cornice and skylight business, at 44 Ann street, Hartford, Conn., having bought the business of the Cullen Cornice & Skylight Works, to which they will add that of plumbing. The firm are composed of E. J. Beseman and J. Bostwick. Mr. Beseman has worked in the metal working shops in many of the large cities throughout the United States for the past 18 years. Of late he has held the position of expert pattern cutter and estimator in the shops of W. E. Disley, at Waterbury, Conn. Mr. Bostwick is thoroughly familiar with the office side of the business, having been for several years Mr. Disley's head bookkeeper. He is also experienced in plumbing and heating work. The new firm have purchased a business stand where a reputation was built up for high grade work. Some of the finest architectural sheet metal construction in New England has been made in this shop. The new firm are well qualified to continue and add to this reputation.

THE NEW PROCESS MFG. COMPANY of St. Louis, Mo., and Dallas, Texas, have favored us with a collection of circulars illustrating and describing the varied lines of goods which they are manufacturing. These include Steel Tanks, Awning Brackets, Corrugated and V Crimped and Roll Cap Steel Roofing, the Superior Steel Cistern, New Process Steel Watering Trough, Imitation Pressed Brick Siding, Flatau's Patent Steel Roofing and Siding, and Brewer's Graphite Elastic Roof Paint,

adapted for tin shingles, iron and felt roofs, smoke stacks, boilers, &c. The company advise us that they are contemplating getting out a catalogue of their goods in the early part of this year.

FLASHINGS.

The special partnership of Lyon, Conklin & Co., Baltimore, Md., having expired by limitation on January 1. W. L. Lyon, C. T. Lyon, D. E. Conklin and C. A. Conklin have formed a special copartnership for the purpose of carrying on a Tin Plate and Metal business under the former title.

The Consumers' Can Company, with office at 15 Exchange place, Jersey City, N. J., have been incorporated with a capital stock of $400,000, by Edgar Kirwin, William C. McGhee, Nicholas S. Turner and Frank M. Dermott, to manufacture Metal Cans.

The Allegheny Steel & Iron Company of Pittsburgh, Pa., will increase their Steel making capacity, by the addition of another open hearth furnace, with a daily capacity of 50 tons. The company also propose making a material increase in their Sheet rolling capacity, which at present is from 40 to 50 tons per day.

The offices of the Youngstown Iron, Sheet & Tube Company of Youngstown, Ohio, have been moved from their plant, at Haselton, to the Federal Building, Youngstown.

John F. O'Dea, assistant general manager of the plant of the Youngstown Iron & Steel Roofing Company of Youngstown, Ohio, resigned his position on January 1, and will devote his time to a new project, of which he is to be the head. Mr. O'Dea was one of the founders of the Youngstown Iron & Steel Roofing Company.

The Hampden Cornice Works, Springfield, Mass., have the contract for the Sheet Metal work on the new operating building at the Dickinson Hospital in Northampton.

The new Tin Plate plant which the McKeesport Mfg. Company of McKeesport, Pa., are about to erect at Port View, will be begun within a short time, under the supervision of Edward Crawford of Duquesne, who was formerly connected with the United States Tin Plate Works, at Demmler, Pa.

The Midland Works of the American Sheet Steel Company gave a banquet on New Year's Eve at the Country Club, at Muncie, Ind., to the superintendents, foremen, shippers, office force, and their wives, Mr. and Mrs. Ambrose Beard acting as host and hostess. The affair was unusual in the Indiana town and was so thoroughly enjoyed that much favorable comment resulted. No detail was omitted that would tend to the pleasure and comfort of guests, even to sending home the young people on a special electric car and the older people to their doors in cabs. Mr. Beard made a brief address that was well received. He thanked his assistants for their co-operation in producing good results and pointed out the many benefits that were derived from harmonious work. He also suggested that the old worn out saying about corporations having no soul be forgotten. He had found it to be true only in isolated cases, and certainly not in that of the American Sheet Steel Company.

If the weather continues mild, it is probable a part of the large new plant of the Youngstown Iron, Sheet & Tube Company, at Youngstown, Ohio, will be started immediately.

Ira B. Smith, Bristol, Conn., finding his facilities inadequate to supply his rapidly increasing trade, has erected a modern factory building. Mr. Smith is now equipped to do all kinds of Sheet Metal stamping and pressing, also dies and tools of every description, patterns, electro-plating, &c.

The Cadwalader Tin Plate & Metal Company of Pittsburgh will apply for a charter on January 28.

Early on the morning of January 4 fire broke out in the Pipe and Gutter factory of Berger Bros. Company, Seventeenth and Clearfield streets, Philadelphia, and gained considerable headway before discovery by the employees of an adjoining works. The Fire Department was prompt in responding to the alarm and quickly had the blaze extinguished, but not until a small section of the second and third floors had burned through and the nearby stock had been damaged. The cause of the fire is unknown, but presumably it came from outside sources, either from passing locomotives or an adjoining forge works. No hands were thrown out of work and everything will be running in its usual order within a few days. The loss is principally on the building, which as near as can be estimated, will range from $1000 to $1500.

Good Advertising.

There is advertising and good advertising, says the *Ironmongers' Chronicle*. In other words, it is possible to spend large sums of money on advertising and to reap no benefits therefrom, and it is also possible to build up a large business by means of a gradual and properly developed system of advertising. Many kinds of advertising are open to manufacturers, but the advantages of using trade journals as advertising mediums are so obvious that we can allude to the subject without fear of being accused of self interest. To reach the trade the trade paper must be employed, and to reach the cream of the trade the best journal and one which has attained a high degree of popularity should be selected. It is of little use to advertise the manufacturer's name and address, and with a brevity—not commendable—state that the advertiser "makes tools or implements." What is wanted is to impress readers with some special qualities of production, remind them of seasonable lines, lead them to ask for quotations, and either by judicious wording or pictorial illustration induce them to associate that firm and that firm alone as the best maker of those particular goods. The makers of novelties and specialties may go further, and stamp upon the minds of their readers the real sterling merit of the goods they offer, and above all, by illustration and description, leave a clear impression on the minds of all who study the advertisement of what the article is like, and to what extent it is likely to become popular. Goods should sell because of their merits, and a clear, living advertisement should be like a clearly explained description. Indeed, those who "live by advertising" say a properly drawn advertisement is equal to a verbal description by an eloquent salesman.

English the World's Language.

Two-thirds of the letters which pass through the post offices of the world, says *Bradstreet's*, are written by and sent to people who speak English. There are substantially 500,000,000 persons speaking colloquially one or another of the 10 or 12 chief modern languages, and of these about 25 per cent., or 125,000,000 persons, speak English. About 90,000,000 speak Russian, 75,000,000 German, 55,000,000 French, 45,000,000 Spanish, 35,000,000 Italian and 12,000,000 Portuguese, and the balance Hungarian, Dutch, Polish, Flemish, Bohemian, Gaelic, Roumanian, Swedish, Finnish, Danish and Norwegian. Thus, while only one-quarter of those who employ the facilities of the postal departments of civilized governments speak as their native tongue English, two-thirds of those who correspond do so in the English language. There are, for instance, more than 20,000 post offices in India, the business of which in letters and papers aggregates more than 300,000,000 parcels a year, and the business of these offices is done chiefly in English, though of India's total population, which is nearly 300,000,000, fewer than 300,000 persons either speak or understand English.

The New York Blower Company of Bucyrus, Ohio, have just completed one of the largest heating apparatus outfits ever built, for the new plant of the Brown Hoisting Machinery Company of Cleveland. The blower company have contracts on hand which will keep them very busy for three months.

THE LETTER BOX.

Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

ALLOWING LAPS ON PATTERNS.

From W. F., Washington.—Referring to the article on "Allowing Laps on Patterns" in *The Metal Worker* of December 21, I beg to differ from the writer as to the proper allowance to be made for wire and laps.

First.—As to wire, in addition to the pattern, material must be allowed equal to two and one-half times the thickness of the wire, to provide for covering wire properly, instead of three times, as described.

Second.—As to laps, for simply soldered seams, sufficient lap outside the net pattern on one side is all that is required.

Third.—For riveted and grooved joints, one-half the seam should be allowed on either side of the net pattern, so that rivet holes punched should come with their centers on the net lines of the patterns.

Fourth.—For grooved seams, exactly one-half of whatever the grooved seam will take up should be allowed on each end of the pattern.

These are the simplest ways of cutting correct patterns, as proved by more than 50 years' practice. As a sample, I may mention that patterns after this rule for sets of measures, the sizes of which I figured out according to very simple rules, have always proved themselves absolutely correct.

Answer.—Taking up the questions in the order presented we would say: While our correspondent in his practice may use two and one-half times the thickness of the wire for wiring that does not change the fact that three times the thickness of the wire brings the metal tight and snug around the wire and against the body of the article to be made.

The second point is exactly in accordance with what was presented in the article mentioned.

In reference to the third point made, it is immaterial whether the rivet holes come directly on the net lines of the pattern, so long as the net lines of the pattern will meet when the article is rolled up and the rivet holes fit over each other.

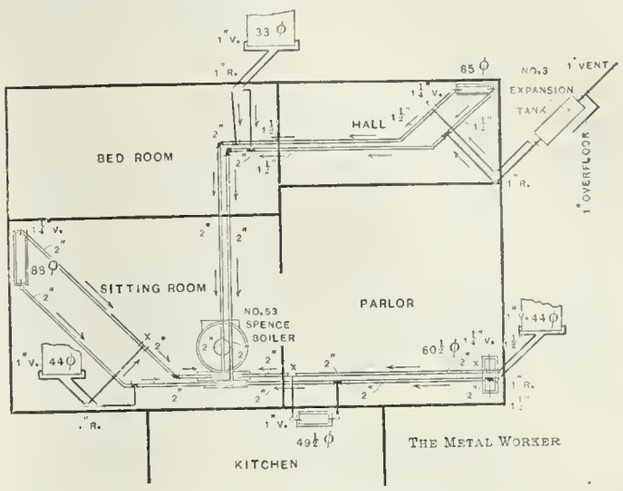
The answer to the third criticism also applies to the last one, it making no difference whether one-half the amount of groove is placed on either side, or single edge on one and double edges on the other, so long as the net lines of the pattern will meet when the article is grooved together.

We appreciate our correspondent's suggestions, giving his methods of allowing laps, which, however, do not imply any error in the method described in the article referred to.

WHAT EMPTIES HOT WATER SYSTEM?

From A. B., Lake City.—I have installed a hot water system according to the piping plan presented herewith. When I fire up strong the thermometer shows that the water starts out from the boiler at a temperature of 220 degrees. Then the water expands and starts out of the overflow pipe of the expansion tank, which acts as a siphon and takes all of the water out of the plant. What is the cause of the trouble, and how can it be remedied?

Note.—We shall be glad if our friends in the heating trade will give their views as to the cause of the trouble. In the meantime we would suggest that the vent pipe from the expansion tank be examined to see that it is open. If the overflow pipe leads from the expansion tank down to the ground, or is connected with a soil or waste pipe, there should be a break in it near the top, so that air can enter to break siphonage. If the boiler capacity is greatly in excess of what would be required for the radiation used in the heating system, and it would be necessary to heat the water very hot to warm the building, it might be possible where small flow and return pipes were used that steam would be generated in the boiler in sufficient quantity to lift the water out of it and expel it from the system if the steam generation was



What Empties Hot Water System?

continued. Apparently there is nothing in the piping that would cause the trouble reported.

PROPORTIONS FOR DELIVERY MILK CANS.

From W. N., New York.—Replying to your correspondent "Proportionist" of Devon, England, who in *The Metal Worker* of November 30, 1901, asked for proportions for delivery milk cans, I inclose two diagrams of 1-quart (United States) kettles, showing side handle on one. While the proportions shown may be pleasing to

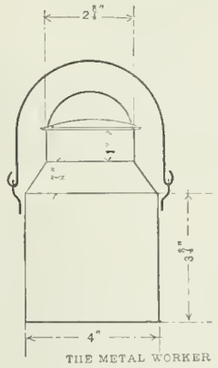


Fig. 1.—With Bail Handle.

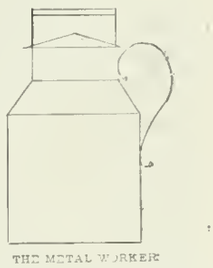


Fig. 2.—With Side Handle.

Proportions for Delivery Milk Cans.

one they may not suit another. But, as the kettle should hold a quart, if the diameter is made greater the hight would be less, while if the diameter is less the hight must be greater, so as to have the required number of cubic inches.

HOW MANY HOT AIR PIPES?

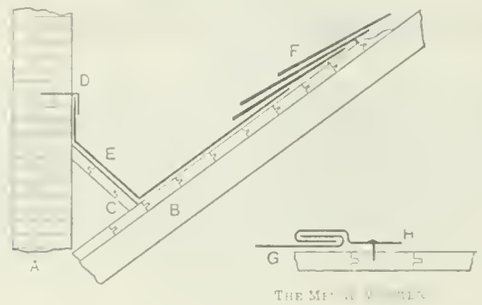
From H. L. N., Pennsylvania.—I should like to know through *The Metal Worker* how many hot air pipes will be needed to heat a three-story building. The first floor is a store, 26 x 30, and 10 feet high; the second floor is a dwelling 8 feet high, and the third floor is a hall 8 feet high, the pipes to be run between the joist and studding. Could I have three registers on one upright pipe; or would it be necessary to run extra pipes?

Note.—There is hardly as much information as to the character of the building and its arrangement as would be needed to answer the question of our correspondent intelligently. *The Metal Worker* has frequently pointed out that large hot air pipes and large vertical stacks or flues furnish the best results in furnace heating. For the work in question a large register in the floor of the store would give the best results, and for a store of this size the piping leading to the register should not be less than 14 inches in diameter. If the store has a large

show window and other windows it might be necessary to have a still larger pipe, or two pipes, to heat it. Inasmuch as it is probable that the hall in the upper part of the building will be over warm rooms, it is possible that one 14-inch round pipe from the furnace will furnish all the heat that is required, provided a flue of sufficient dimensions is used from the round pipe in the cellar to the register in the hall. It may be necessary to extend a breast out into the building to contain the flue that runs to the third floor, which can also be used for heating the rooms on the second floor. The flue for the hall should not be less than 8 x 14 inches. This breast should be arranged to come up between two rooms on the second floor so that two upright flues for heating rooms in the dwelling could be on each side of it. Sizes of pipes and vertical flues for heating the dwelling can only be determined on knowing the size of the rooms and their number.

LINING GUTTERS WITH COPPER.

From N. L., Middletown, Conn.—I have two gutters to line with 16-ounce copper, each 75 feet long. One side turns up against a brick wall, while the other side turns up under the slate roof. The width of the gutter requires 84-inch copper, and I propose using sheets 30 x



Lining Gutters with Copper.

84 inches. To allow for the expansion and contraction of the metal, would it be best to counterflash and cleat the sheets or nail them? Please inform me through *The Metal Worker* of the best way to lay in the copper which will allow for expansion and contraction.

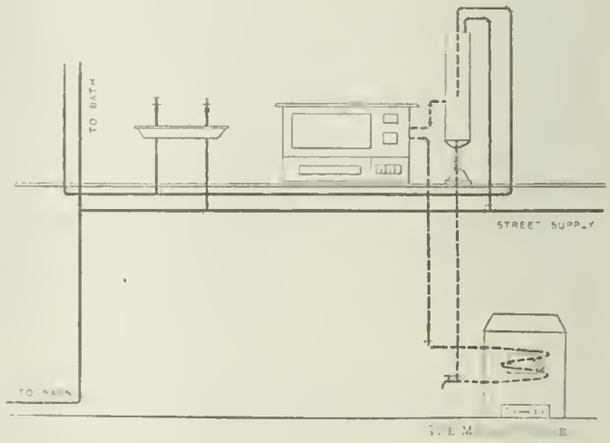
Answer.—Under no consideration should the copper lining be nailed to the sheathing. When the walls at the side and two ends, shown by A in the accompanying illustration, are carried up as far as D, build in a cap flashing as there shown. The carpenter should then line out the gutter or valley with smooth sheathing warranted not to shrink, as shown by B and C, being careful to have a good pitch toward the leaders. The copper lining E is then put in position, slipping one end under the cap flashing D, and the other under the slating F. We would suggest using copper 36 inches wide in place of 30 inches, as this will save a seam on every five widths. Where the cross seams occur the sheets should be thoroughly tinned 2 inches wide on both sides and a lock placed thereon and fastened with cleats, as shown in the illustration, where G represents the sheets fastened by the cleat H, and nailed to the sheathing at I. In no case should the sheet be nailed directly to the wood lining, because the expansion and contraction of the metal would cause the copper to tear out at the nail. By using cleats the copper has a chance to expand with the heat of the sun and contract with the cold, the portions under the cap flashing and slate being entirely free. When the locked seams are thoroughly closed with the mallet use heavy coppers and thoroughly soak the seams with half and half solder, raising the cap flashing slightly to allow the soldering of the upright seam. Then lay a smooth board about 6 x 12 inches over the cap flashing and dress down well with the mallet.

WHAT IS THE BEST ROOF COVERING FOR ROUNDHOUSE?

From I. E. D., Atlantic, Iowa.—In reply to the inquiry of "W. M.," in *The Metal Worker* of December 14, for a good roof for a roundhouse, I would recommend slate or tile for such roofs. But their weight necessitates a heavy structure to support them, making the roof very expensive. If "W. M." will first put on the sheeting thoroughly dried matched pine flooring, and then give it a good heavy coat of paint, consisting of 5 pounds of Venetian red and 1 pound of litharge to 1 gallon of linseed oil, and allow it to dry thoroughly, he will be ready for the next step. After the paint is dried a good grade of felt paper should be laid over it. He then can put on a roof with flat seams, using tin plate of a good brand, not more than 14 x 20 in size. This should be well painted on the underside with the same paint that was used on the sheeting. But the paint should be kept well stirred while it is being used. If he follows these suggestions I think the roof will give as good satisfaction as a roof made of any other kind of material. Of course it is very necessary that the roof should be put on by a reliable workman. It should be nailed every 4 inches, and should have ½-inch lock at the beams. It should be soldered with about 5½ pounds of solder to the square, using good heavy soldering coppers that will soak the solder in good. I would use for the flux muriatic acid cut with zinc until it will use no more zinc, then further dilute by the use of one-third its bulk in clean soft water. After the roof is completed it should be carefully painted, when it will be found to be less expensive than the heavier roofs, and with care should prove just as durable.

COLD WATER FROM BOTH FAUCETS.

From I. D. H., Sun Prairie, Wis.—There is a hot water service system in a residence here which is evidently arranged wrong, as hot and cold water come from both faucets. The sketch herewith shows the location of the different fixtures. We desire to heat the water by means



Cold Water from Both Faucets.

of a pipe coil in the furnace in the winter season, and by means of a water back in the range in the summer season. Kindly give a sketch showing the proper arrangement of pipes and connections with the range and furnace.

Answer.—Sometimes, when hot water can be drawn at the cold water faucets, it is because the delivery tube connected with the cold water supply to the boiler has dropped down inside the boiler, or has not been put in place. Under such circumstances the cold water often rushes into the boiler and out through the hot water pipe. Again, where the pipes are long and exposed the water in the hot water pipe will cool and considerable cold water will come before the hot water flows. If the piping, however, is arranged as shown by the dotted lines in the sketch there will be a positive circulation between the boiler and the water heaters, and no danger of cold water ever flowing from the hot water pipe, except the water that is cooled in the hot water pipe, and this can be largely reduced by covering the pipe to protect it from the cold air.

To harden small tools or articles that are likely to warp in hardening, says *Shop Talk*, heat very carefully, and insert in a raw potato, then draw the temper as usual. A bar of hard soap is also good, but will not make the tool as hard as the potato will.

TRADE REPORT.

MARKET SUMMARY.

Pig Tin is weak and dull, and about ½c. lower.

Copper is still weak and unsettled, with further decline anticipated.

Pig Lead is quiet and unchanged.

Spelter continues in light demand, but firmer for spot.

Antimony is without change.

Nickel continues firm and unchanged.

Aluminum is active at former prices.

Tin Plates are quiet and without change.

Sheets have stiffened again and continue in large demand.

Sheet Copper is quiet on the decline.

Sheet Zinc is in moderate demand at former prices.

Pig Iron is very active and strong; Foundry Pig at Pittsburgh is 50c. higher.

Scrap Iron is active and stiffer in price.

Old Metals are dull and weak.

Rolled and Sheet Brass is 5 per cent. lower.

Brazed Brass Tubes have been reduced 5 per cent. in price.

Seamless Brass and Copper Tubes are down 3c. per lb.

Brass Wire and Rods have been reduced 7½ per cent.

Salt Glazed Sewer Pipe is the subject of a new price-list, which contains several changes.

Lead Pipe prices were reaffirmed this week.

Plumbers' Brass Goods are dull, with likelihood of lower prices.

Soldering Coppers have been reduced in price.

Solder is about ½c. lower.

Building Papers have been advanced in price.

Wire Nails are stronger.

Cut Nails are in moderate demand and unchanged as to price.

Wire is in heavy demand at former prices.

Window Glass is dull, with uncertainty as to prices.

White Lead prices are irregular.

Linseed Oil was advanced 5c. per gallon.

Spirits Turpentine is unchanged and firm.

METAL MARKET.

NEW YORK, January 10, 1902.

Pig Tin.—A weak and declining market characterized the week under review. Business was very light and prices made a further decline as compared with those of a week ago, notwithstanding a spurt of improvement in London on Wednesday. The reaction, however, was of very short duration and prices settled back again to the lowest level reached for some time past. Jobbers' prices for Straits Pig in small lots were quoted at 23¾c. to 24¼c. per lb.

Copper.—The market has remained in the unsettled state which has marked it since the first cut in prices at the end of last year. At the close of the week a rumor was prevalent that another cut in Copper had been decided upon by the principal selling interests. It is understood that concessions are being offered by producers, but the trade do not seem to be taking advantage of the shading in values, anticipating a still further decline in the near future. The opinion is freely expressed that the present price of Copper is at least 2c. above bottom prices. Lake Ingot is selling in a retail way at about 13½c. to 14c. per lb., and Casting Copper is 13¼c. to 13¾c. These prices, however, must not be assumed as accurately representing the present market rates, for business is so light that there is really no market for Ingot Copper. Following is the table of annual Copper statistics, as compiled by the New York Metal Exchange, in gross tons:

Supplies.	1901.	1900.	1899.
*Domestic production, as per producers' returns	266,452	268,787	262,206
Net importations of foreign	61,286	38,182	39,858
Total supplies	327,738	306,969	302,064
Exportations.			
Exports of domestic to Europe	92,408	151,988	112,637
Exports of domestic to British North America	616	688	435
Exports of domestic to Mexico	85	151	130
Contents of sulphate	5,338	4,852	2,392
Total exportation	98,447	157,679	115,594
Deducting exportations from supplies, there were available for home consumption	229,291	149,290	186,470

* Domestic production for December estimated.

Sheet Copper.—The reduction of 3c. in the price of Sheet Copper, made on January 2, has, so far, had but little effect in stimulating the demand, which is naturally light at this season of the year. It is expected, however, that orders will soon begin to come in, provided consumers become satisfied that the existing base price of 18c. for Sheet Copper is likely to hold.

Pig Lead.—There was no change in the Lead situation here. The market remains very quiet, business being confined to small purchases for current use. Prices are unchanged, jobbers quoting small lots of American Pig at 4.40c. to 4½c. per lb. St. Louis advices report a more settled condition in Pig Lead in that market.

Spelter.—A very light demand for Spelter is noted, but the market showed a firmer tone as to spot metal. Jobbers quote good Western brands in small lots at 4⅝c. to 4¾c. per lb. St. Louis advices are to the effect that the Spelter market there has lapsed into quietness, and that prices have sagged off to some extent.

Sheet Zinc.—The demand for Sheet Zinc is of fair proportions, and prices are unchanged. Jobbers quote 600-lb. lots at 6¾c., and smaller quantities at 7¼c. per lb.

Antimony.—There is no change in this metal, Cookson's in small parcels is quoted at 10½c. to 11c., and Hallett's at 8¼c. to 8¾c. per lb.

Nickel—Is unchanged, continuing on the basis of 60c. to 65c. per lb. for small lots.

Aluminum.—Manufacturers of Aluminum report a continued active and steady demand for this metal. Prices are without change. Small lots of No. 1 Ingot guaranteed 99 per cent. pure rule at 37c. per lb., and 100-lb. lots at 35c.

Tin Plates.—The feature of the Tin Plate market this week was the announcement by the American Tin Plate Company of their readiness to take orders for Plates for delivery in the second quarter of this year at present prices. Large business was of very moderate proportions, but a fair degree of activity was noted in the retail demand, which is larger than is usually the case thus early in the year. American Bessemer Coke Plates, IC, 14 x 20, in small lots, delivered at New York and corresponding points, are selling at about $5 to $5.25 per box. A further decline of 3 pence per box in the price of Welsh Plates was noted this week, bringing them down to 12 shillings 6 pence, f.o.b. Swansea.

Sheets.—The scarcity and high prices of Steel, together with the fact that the demand for Sheets always increases in the first two or three months of the year, has given the market a decidedly stronger tone, and some comparatively low prices made by some of the outside mills were withdrawn this week. Some large contracts for Sheets for extended delivery are being placed with the mills, and there is every reason to expect that the market will retain its firmness for some time to come. While deliveries from mills are coming in rather more freely, they do not yet suffice to entirely meet the requirements of consumers, and the scarcity of some sizes is still felt. Prompt deliveries on both Black and Galvanized Sheets are still hard to get and

command premium prices. Jobbers are quoting No. 27 One Pass Cold Rolled Soft Steel Sheets in small lots at 4c. to 4.05c., and Galvanized Sheets at 65 to 67½ per cent. off the list.

Chicago advices are as follows: The inquiry is stronger, but the number of independent mills has increased to such an extent that their competition for business is becoming noticeable. A good demand is enjoyed by jobbers, but even for this class of trade the competition is growing a little sharper. Small lots of No. 27 Black Sheets are quoted at 3.50c., and Galvanized at 70 to 70 and 5.

St. Louis reports as follows: At the opening of the new year the market for Sheets is showing a stronger and more active condition, with prices holding at former level. Jobbers quote Stove Pipe size, No. 27, 3.45c. to 3.50c., and Galvanized Sheets, 65 and 10 off.

Old Metals.—The scarcity and high price of Pig Iron have caused a larger demand for Scrap Iron, with a stiffening in price. Old Metals of other descriptions are in light demand and prices unsettled. Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper	per lb. 10 c.
Light and Tinned Copper	per lb. 8¼c.
Heavy Brass	per lb. 7¼c.
Light Brass	per lb. 6 c.
Lead	per lb. 3¾c.
Pea Lead	per lb. 3¼c.
Zinc	per lb. 3 c.
No. 1 Pewter	per lb. 16 c.
No. 2 Pewter	per lb. 8 c.
Tin Plate Scrap, per gross ton	$6.00 to $6.50
Wrought Iron Scrap, per gross ton	11.00 to 11.50
Heavy Cast Scrap, per gross ton	10.50 to 11.00
Stove Plate Scrap, per gross ton	8.00 to 8.25
Burnt Iron, per gross ton	5.50 to 5.75

THE PIG IRON MARKET.

New York.—Additional quantities of Foundry Iron have been purchased by some of the larger interests. The scarcity of Pig Iron for immediate delivery is becoming more pronounced. It is expected that the price of Southern Pig Iron will be generally made $12, Birmingham, for No. 2. We quote for Northern Irons: No. 1, $16.50 to $17.50; No. 2X, $16 to $16.50; No. 2 Plain, $15.50 to $16; Tennessee and Alabama brands, No. 1 Foundry, $16.25 to $16.75; No. 2 Foundry, $15.75 to $16; No. 1 Soft, $16.25 to $16.75; No. 2 Soft, $15.75 to $16; No. 3 Foundry, $15.25 to $15.50; No. 4 Foundry, $14.75 to $15.

Chicago.—Inquiries are numerous, but business is checked by the hesitation of manufacturers who feel themselves unable to take contracts for delivery during the next three or four months, because of the Coke scarcity. Lake Superior Charcoal Iron is in strong demand, several sales of round lots being reported, while a great deal of business has been done in small lots. The foundries in the Northwest are now using Charcoal Iron for ordinary castings, because of the difficulty in securing Coke Iron. Some sales are reported by both Northern and Southern companies for delivery during the last half of the year. Nearly all Southern furnace companies have now advanced their prices to our maximum quotation. It is claimed that practically no Iron can be had at the inside figures. We quote as follows:

Lake Superior Charcoal	$19.25 to $19.50
Local Coke Foundry, No. 1	16.00 to 16.50
Local Coke Foundry, No. 2	15.50 to 16.00
Local Coke Foundry, No. 3	15.00 to 15.50
Local Scotch, No. 1	16.00 to 16.50
Ohio Strong Softeners, No. 1	17.60 to 17.85
Southern Silvery, according to Silicon.	16.15 to 16.40
Southern Coke, No. 1	15.65 to 16.15
Southern Coke, No. 2	15.15 to 15.65
Southern Coke, No. 3	14.65 to 15.15
Southern Coke, No. 1 Soft	15.65 to 16.15
Southern Coke, No. 2 Soft	15.15 to 15.65

Philadelphia.—Under the unsettled conditions of the Pig Iron market, due to the difficulty in securing sufficient transportation facilities, prices are very much unsettled, and it is impossible to fix upon any standard at the present time, each and every transaction being made upon its own merits. For prompt shipment $16.75 to $17 is quoted for No. 2 X Foundry, and a number of sales have been made on this basis. Some holders are very cautious in quoting on large lots, as they are considering whether $18 Iron may not be seen before the end of the month. Iron is very scarce, and sellers can get pretty nearly their own price for prompt shipments. For three to six months' contracts prices will be about as follows for New York and nearby points: No. 1 X Foundry, $17.25 to $17.50; No. 2 X Foundry, $16.50 to $17; No. 2 Plain, $16 to $16.50.

Pittsburgh.—Deliveries of Coke to the furnaces have been better than for some time and it looks as though the worst of the trouble might be over. Foundry Iron for first quarter delivery can hardly be had at any price, as the furnaces are so well sold up that they have very little Iron to spare. We quote Standard Bessemer Iron at $16.75 and No. 2 Foundry at $16.50 to $16.75. Pittsburgh.

Cincinnati.—There has been no holiday respite in the Pig Iron trade this season. Selling has been continued right through the usual dull season on a very liberal basis. The amount of Iron sold has been gauged, in the main, by the amount of stock the different furnaces have had to offer, and deliveries are contracted covering well nigh the entire year. In prices there is hardly the uniformity that was presented a few weeks ago; the leading Southern interest still holds to the $11.50 base for No. 2, while other furnaces have advanced 50c. over that figure. The market is exceedingly strong and the outlook for activity as bright as it has been. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$14.75 to $15.25
Southern Coke, No. 2	14.25 to 14.75
Southern Coke, No. 3	13.75 to 14.25
Southern Coke, No. 4	13.25 to 13.75
Southern Coke, No. 1 Soft	14.75 to 15.25
Southern Coke, No. 2 Soft	14.25 to 14.75
Southern Coke, Gray Forge	13.25 to 13.75
Southern Coke, Mottled	13.25 to 13.75
Ohio Silvery, No. 1	16.25 to 16.75
Ohio Silvery, No. 2	15.75 to 16.25
Lake Superior Coke, No. 1	16.60 to 17.10
Lake Superior Coke, No. 2	16.10 to 16.60
Lake Superior Coke, No. 3	15.60 to 16.10

St. Louis.—Very heavy buying has marked the opening days of the year. Since our last report an advance of 50c. per ton on all grades has been put into effect. Better than 30-day deliveries are out of the question, and then the tonnage of such shipments is necessarily small. Practically all the furnaces are sold up for the first three months, and heavy requirements are booked through the first half. Several contracts are to be noted covering requirements for the last half of the year. It is said that the transportation feature shows slight improvement. We quote as follows for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry	$16.00 to $16.25
Southern, No. 2 Foundry	15.25 to 15.50
Southern, No. 3 Foundry	14.75 to 15.00
Southern, No. 4 Foundry	14.25 to 14.50
No. 1 Soft	15.75 to 16.00
No. 2 Soft	15.25 to 15.75

CHICAGO REPORT.

Scrap Iron and Steel.—Prices are strong, in sympathy with the strength of new Iron and Steel. Cast is in particularly good demand. We quote dealers' buying prices for carload lots, Chicago delivery, as follows:

	Per net ton.
Country Wrought Scrap	$11.00 to 11.50
Machinery Cast	10.50 to 11.00
Malleable Cast	10.00 to 11.00
Stove Plate (free from burnt)	8.00 to 8.50
Burnt Iron and Grate Bars	5.50 to 6.00
Sheet Iron and Hoops	6.00 to 7.00
Plow Steel	.... to 10.00
Breaking Stock	9.00 to 10.00
No. 2, such as Shovels, Hoes, &c	.... to 7.00
Old Boilers—whole (Iron)	6.50 to 7.00
Old Boilers (Iron) cut in single Sheets and Rings	10.00 to 11.00
Old Gas Pipes and Boiler Tubes	10.50 to 11.00
Cast Borings	4.50 to 5.00
Turnings	9.50 to 10.00
Horseshoes	12.00 to ....

Old Metals.—Business is almost at a standstill, consumers being afraid to buy and dealers refusing to take losses on their stocks bought at high rates. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	10 c.
Copper Bottoms	8¼c.
Copper Clips	10 c.
Red Brass	9¼c.
Yellow Brass	7½c.
Red Brass Borings	9 c.
Yellow Brass Borings	6¼c.
Light Brass	6¼c.

Pipe Lead	3.55c.
Tea Lead	3¼c.
Zinc	3 c.
Tin Foil	18 c.
Pewter, No. 1	16 c.
Pewter, No. 2	14 c.

Old Rubber.—Very little is now doing. We quote as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	46.00	.....
Rubber Shoes	....	7 c.
Rubber Car Springs	....	5½c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6¾c.
Black Rubber	....	4¼c.
White Rubber	....	8½c.

Rags.—Dealers quote buyiug prices of good Country Mixed Rags, Chicago delivery, at 75c. to 85c. per 100 lbs. in auy quantity.

Anthracite Coal.—A medium trade is in progress, the weather being mild throughout the West. Prices are unchanged, as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis.	5.75	6.00
St. Louis	6.20	6.45
Kansas City, Mo.	8.25	8.50

THE HARDWARE TRADE.

Notwithstanding the short time which has elapsed since the opening of the year there is already a quickening in the demand, and merchants are evidently getting ready without delay for the business which will soon be upon them. The number of travelers who have entered upou their routes is increasing from day to day, and very satisfactory reports are begiuning to come in from those who were earliest in the field. It is assumed that most houses are finding that last year was a profitable one and that its results will enable them to prosecute business with renewed vigor and enterprise. There is a disposition to order goods in advance of actual need, as in many lines there has been delay in shipment on account of mauufacturers beiug unable to turn them out in sufficient volume to meet their customers' requirements. The difficulty whlch manufacturers have had in procuring raw material is one of the causes of this condition, and even at the present time after the holiday lull in the demand there is still much complaint by them on this score. This naturally influences goods iu the matter of price, especially those lines in which the large proportion of the cost is iron or steel, and the market ls rendered decidedly strong. There is some reason to anticipate further advances in some of these lines, notwithstanding the fact that most representative manufacturers regard with dlsapproval any movement toward higher prices, knowing that it will be followed sooner or later by an inevitable reactiou.

Hardware generally is held at satisfactory prices, feeling the effect of the existing state of things ln the iron market and the large volume of busiuess which has been dolng and is expected during the season. The labor cost of goods is unobtrusively but steadily increasing, inasmuch as while there are but few open advances, practically every Hardware manufacturer finds it necessary to increase wages in individual cases or in certain departments from time to time. Some kinds of heavy goods which have been exceptionally scarce are in better supply, and it is possible where these have been held at high prices, owing to the practical control of the market pendlng the development of outside competition, that with the entrance into the field of compoting products a revision of prices may result. Some lines which have been more or less weak on account of reaction from such hlgh prices are apparently finding their level and a more confident tone is prevailing with more ruglar prices. If the volume of business is at all up to expectations there will be undoubtedly a scarcity in several branches of the trade.

The Trenton Porcelain Company of Trenton, N. J., have been incorporated with a capital stock of $100,000 by Franklin H. Burroughs, George E. Maguire and George F. Fell to manufacture Pottery.

NOTES ON PRICES.

Lead Pipe.—At a meetiug of the Eastern Lead Pipe Association, held in New York on Tuesday, January 7, the price of Lead Pipe was reaffirmed. It is believed that no change will be made in the price of this material in the future unless Pig Lead values should decline radically, which seems unlikely. The demand for Lead Pipe aud Sheet Lead has been excellent and the outlook for a large cousumption in 1902 is thought to be favorable.

Plumbers' Brass Goods.—The sharp decliue iu Copper will, it is expected, cause the announcement of lower prices on Plumbers' Brass Goods after the meeting of the Executive Committee of the Brass Goods Manufacturers' Association, scheduled for the 14th inst. A revisiou of prices based on 13-cent copper is thought likely. The demaud for Brass Goods, as is uatural under the circumstances, has fallen to a very small volume. Buyers are not taking anything iu this line beyond what their immediate needs dictate.

Soldering Coppers.—The price of Soldering Coppers has fallen, in sympathy with the decline in Ingot Copper.

Tinware.—The trade are watching the Tinware market in anticipation of advanced prices, as the result of the conferences, which, it is uuderstood, have been taking place between the manufacturers. Practically all articles in the line of Sheet Metal Household Goods are held very firmly, and it is anticipated that higher prices may be announced in the near future. Trade is still feeling the effect of the strike of last summer and stocks are bare, and with the existing demand and the promise of its continuance, are not likely to be full during the next few months at least. There is much delay in executing orders for steel and the car famine is increasing the difficulty of the situation.

Hollow Ware.—Prices in the Hollow Ware market are steadily maintaiued, but ou a level which is referred to by the manufacturers as uncomfortably low, notwithstanding the advances which took place during the last year.

Chain.—The Chain market is very firm, aud it ls thought by some that advances may be necessitated in the near future if the present condition of the market in raw material continues.

Rolled and Sheet Brass, &c.—Uuder date of January 2, 1902, the price of Rolled aud Sheet Brass and Bronzed Tubes underwent a reduction of 5 per cent. each; Brass Wire and Rods were lowered 7½ per cent. and Seamless Brass Tubes decliued 3 cents. The price of Brass Scrap is fixed at 9 cents net, of Low Brass Scrap at 10 cents and Bronze or Gilding Scrap at 11 cents per pound, all being subject to the usual terms. On account of the unsettled condition of the metal market these prices are subject to change without notice.

Seamless Brass and Copper Tubes.—The price of Seamless Brass and Copper Tubes on January 2, 1902, was reduced 3 cents per pound net. A new list on these goods will be issued within a short time.

Wire Nails.—The Wire Nail market has a somewhat firmer tone, as manufacturers are withdrawing some of the extremely low prices which have been current. The price which has been ruling has been uncomfortably low for outside manufacturers who have not the best facilities for producing goods at a minimum cost. The Wire Nail market in New York reflects the usual coudition of trade immediately after the first of the year. The demand from mills, however, is said to begin to show improvement, and contracts are being placed quite liberally for the spring trade.

Cut Nails.—There is a moderate demand for Cut Nails in the New York market. Representatives of mills are adhering to the price of $2.25 for Nails from store. Jobbers are making the same price gonerally, but in some instances are selling at 2 cents below these figures.

Wire.—The current demand for Plain Wire is heavy, and the output of tho mills is absorbed about as fast as made. The outlook for spring trade is excellent.

Sheet and Bolt Copper.—As noted in our last issue, the manufacturers of Sheet Copper, Copper Bottoms, Pits and Flats, &c., reduced the base price 3 cents to 18 cents per pound on January 2, 1902, in correspondence with the decline in the price of Ingot Copper. The following are the new net prices, as issued by the Ansonia Brass & Copper Company of New York, terms being cash:

PRICES OF SHEET COPPER.

Sizes of sheets.		64 oz. and over 50 lb. sheet, 30 x 60 and heavier.	32 oz. to 64 oz. 25 to 50 lb. sheet, 30 x 60.	24 oz. to 32 oz. 18¾ to 25 lb. sheet, 30 x 60.	16 oz. to 24 oz. 12½ to 18¾ lb. sheet, 30 x 60.	14 oz. and 15 oz. 11 to 12½ lb. sheet, 30 x 60.	12 oz. and 13 oz. 9½ to 11 lb. sheet, 30 x 60.	10 oz. and 11 oz. 7¾ to 9½ lb. sheet, 30 x 60.	8 oz and 9 oz. 6¼ to 7¾ lb. sheet, 30 x 60.	Lighter than 8 oz.
		Cents per pound.								
Not wider than 30 inches	Not longer than 72 inches	18	18	18	18	19	20	21	24	27
	Longer than 72 inches, not longer than 96 inches	18	18	18	18	19	21	24	27	....
	Longer than 96 inches	18	18	18	18	20	24	....	....	...
Wider than 30 inches but not wider than 36 inches	Not longer than 72 inches	18	18	18	18	20	22	25	28	....
	Longer than 72 inches, not longer than 96 inches	18	18	18	18	20	24	27	....	....
	Longer than 96 inches, not longer than 120 inches	18	18	18	19	21	....	....	....	....
	Longer than 120 inches	18	18	19	20	....	....	....	....	....
Wider than 36 inches but not wider than 48 inches	Not longer than 72 inches	18	18	19	20	22	25	28	....	....
	Longer than 72 inches, not longer than 96 inches	18	18	19	21	23	26	....	....	....
	Longer than 96 inches, not longer than 120 inches	18	18	20	22	26	....	....	....	....
	Longer than 120 inches	18	19	21	24	....	....	....	....	....
Wider than 48 inches but not wider than 60 inches	Not longer than 72 inches	18	18	19	21	24	29	....	....	....
	Longer than 72 inches, not longer than 96 inches	18	18	20	22	27	....	....	....	....
	Longer than 96 inches, not longer than 120 inches	18	19	21	24	....	....	....	....	....
	Longer than 120 inches	19	20	22	26	....	....	..	....	....
Wider than 60 inches but not wider than 72 inches	Not longer than 96 inches	18	19	21	26	....	....	....	....	....
	Longer than 96 inches, not longer than 120 inches	18	20	23	28	....	....	....	....	...
	Longer than 120 inches	19	21	26	....	....	....	....	....	....
Wider than 72 inches but not wider than 108 inches	Not longer than 96 inches	19	21	24	....	....	....	....	....	....
	Longer than 96 inches, not longer than 120 inches	20	22	25	....	....	....	....	....	....
	Longer than 120 inches	21	23	27	....	....	....	....	....	
Wider than 108 inches	Not longer than 132 inches	22	24	....	....	....	....	..	....	....
	Longer than 132 inches	23	26	....	....	....	....	...	....	....

Rolled Round Copper, ¾ inch diameter or over, 18 cents per pound. (Cold Drawn, Square and Special Shapes, extra.)
Circles, Segments and Pattern Sheets three (3) cents per pound advance over prices of Sheet Copper required to cut them from.
All Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, one (1) cent per pound over the foregoing prices.
All Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, two (2) cents per pound over the foregoing prices.
Cold Rolled and Annealed Copper, Sheets and Circles, wider than 17 inches, take the same price as Cold or Hard Rolled Copper of corresponding dimensions and thickness.
All Polished Copper, 20 inches wide and under, one (1) cent per pound advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 inches wide, two (2) cents per pound advance over the price for Cold Rolled Copper.
Planished Copper, one (1) cent per pound more than Polished Copper.
Cold Rolled Copper prepared suitable for polishing, same prices and extras as Polished Copper

Tinning.

Tinning Sheets on one side, 2½ cents per square foot.
For Tinning both sides, double the above price.
For Tinning the edges of sheets one or both sides, price shall be the same as for Tinning all of one side of the specified sheet.

Copper Bottoms, Pits and Flats.

	Cents.		Cents.
14 ounces to square foot, and heavier, per pound	22	10 ounces and up to 12 ounces	25
12 ounces and up to 14 ounces to square foot, per pound	23	Lighter than 10 ounces	28

Circles less than 8 inches diameter, 2 cents per pound additional. Circles over 13 inches diameter are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1 cent per pound extra.

"A. B. C." Cold Rolled and Polished Copper.

	16 oz. and heavier. Cents per lb.	14 oz. Cents per lb.	12 oz. Cents per lb.	10 oz. Cents per lb.		16 oz. and heavier. Cents per lb.	14 oz. Cents per lb.	12 oz. Cents per lb.	10 oz. Cents per lb.
14 x 48	20	21	23	24	14 x 60	20	21	23	24
14 x 52	20	21	23	24	24 x 18	21	22	24	25
14 x 56	20	21	23	24	30 x 60	21	22	24	25

Tinning.

Tinning Sheets on one side, 2½ cents per square foot.
For Tinning both sides, double the above price.
For Tinning the edges of sheets one or both sides, price shall be the same as for Tinning all of one side of the specified sheet.
For other sizes of Polished Copper add to price of Cold Rolled Copper.
Sheets 20 inches wide and under, per lb. 1c. | Sheets over 20 inches wide, per lb. 2c.
Planished Copper, 1 cent per pound more than Polished Copper.

Window Glass.—While the future status of Window Glass has not yet been determined, the local Glass market in New York is reported stronger than for some time, and jobbers are hopeful that the price war between manufacturers may be avoided. There is but little demand for Glass at the present time. Prices are unchanged.

White Lead.—Considerable competition is reported among manufacturers of White Lead in Oil, and prices are somewhat irregular. White Lead in Oil is quoted, in a retail way, at about 6½ cents per pound.

Building Papers.—There has been an average advance in Tarred Papers equivalent to about $2 a ton on Single Ply Tarred Roofing Felt and 5 cents a roll each on Two and Three Ply Tarred Felt. Prices seem to have advanced all over the country, although there are a few soft spots where competition is very keen. For the Eastern Trade the retail price of Single Ply Tarred Felt is $28 to $30 per ton; Two Ply, 50 to 55 cents per roll, and Three Ply, 75 to 80 cents per roll, delivered. The largest buyers at manufacturing points can shade these figures somewhat. Rosin Sized Sheathing, Deafening and Slaters' Felt and Water Proof Papers remain practically as they were, the prevailing weather exerting a deterrent effect on building.

Salt Glazed Sewer Pipe.—The Eastern and Western manufacturers of Vitrified Salt Glazed Sewer Pipe and Fittings adopted a new price-list December 19, 1901. There are several changes in the standard lists of Pipe, which are principally in the larger sizes. The lists have been adopted by all the manufacturers, we are advised, and the different makers have signified their intention of adhering to the schedule of discounts for the different territories. The list is as follows:

Price-List of Salt Glazed Sewer Pipe.

Adopted by Eastern and Western manufacturers, December 19, 1901.

Caliber of pipe.	Price per foot.	Elbows and curves 2 feet long or less, each.	Branches 1 foot and 2 feet long, each.	Branches 2½ feet long, each.	Slants per 1 foot or less, long side.	Running, P. S. and single H. traps, each.	Double hand hole traps, each.	Two-piece traps, per pair.
2 inches..	$0.16	$0.50	$0.72	....	....	1.50	....	....
3 inches..	.16	.50	.72	....	....	1.50	1.90	....
4 inches..	.20	.65	.90	....	.60	2.00	2.50	....
5 inches..	.25	.85	1.13	....	.75	2.50	3.13	....
6 inches..	.30	1.10	1.35	....	.90	3.50	4.25	3.60
8 inches..	.50	2.00	2.25	....	1.50	6.60	7.75	6.00
9 inches..	.60	2.40	2.70	....	1.80	7.50	9.00	6.60
10 inches..	.75	3.00	3.40	....	2.25	9.00	11.00	7.80
12 inches..	1.00	4.00	4.50	....	3.00	15.00	16.50	12.75
15 inches..	1.35	5.40	6.10	....	4.05	22.00	24.00	18.75
18 inches..	1.70	6.80	7.65	....	5.10	....	....	....
20 inches..	2.25	9.00	10.13	....	6.75	....	....	....
21 inches..	2.50	10.00	11.25	....	7.50	....	....	....
22 inches..	2.75	11.00	12.38	....	8.25	....	....	....
24 inches..	3.25	13.00	14.63	....	9.75	....	....	....
27 inches..	4.25	20.00	....	21.25	...	....	....	....
30 inches..	5.50	27.50	....	27.50	...	....	....	....

Pipe of all sizes may be furnished with sockets or rings, and ring Pipe sold without rings may be sold at a discount of 10 per cent. from bill.

Increasers shall have socket on small end; Reducers, socket on large end; and shall be charged at double the price of 2 feet of Pipe, size of large end.

Each piece of Channel or Split Pipe shall be charged as three-fifths of a whole Pipe.

Stoppers or Plugs for closing Pipe, one-third of 1 foot of Pipe of the size in which it is used.

Fifty per cent. additional for Inlets 15 inches or larger on any size Pipe.

Branches 3 feet in length, add price of 2 feet of Pipe to price of 2-foot branch.

Each Inlet in addition to single branch shall be charged for at price that is added to straight Pipe for first Inlet.

SLOP AND CLOSET BOWLS, each, with or without Strainers.

12 x 6	$3.50
12 x 4	3.50
15 x 6	5.00
15 x 4	5.00

WELL TRAPS, each.

6-inch	$2.00
8-inch	3.30
9-inch	3.90
10-inch	4.70
12-inch	6.00

CELLAR TRAPS, each.

9 x 4, with bottom	$6.00	Without bottom	$5.00
12 x 4, with bottom	9.00	Without bottom	6.00

GREASE TRAPS, each.

8-inch, with bottom and cover	$6.00
10 " " "	7.50
12 " " "	10.00
15 " " "	15.00
18 " " "	20.00

BIRD CAGE WIND GUARDS, each.

6-inch	$2.50
7-inch	3.00
8-inch	3.60
10-inch	7.00
12-inch	10.00

MANDARY TOPS.

Same price as the Bird Cage Wind Guards.

WIND GUARD BONNETS, each.

5-inch	$1.40
6-inch	1.60
7-inch	2.00
8-inch	2.40

WALL COPING LIST, per foot.

8-inch and 9-inch	$0.35
12-inch and 13-inch	.55
18-inch	1.00

Corners, Angles and Closed Ends or Starters, each three times the price of 1 foot of straight Coping.

From the above list a series of discounts are made for the six different districts into which the country is divided, as follows:

DISTRICT No. 1.—New England.
DISTRICT No. 2.—New York and New Jersey.
DISTRICT No. 3.—Maryland, Delaware and District of Columbia and Pennsylvania east from a line on the eastern boundary lines of McKean, Cameron, Clearfield, Cambria and Somerset counties.
DISTRICT No. 4.—Pennsylvania west of a line on the eastern boundary line of McKean, Cameron, Clearfield, Cambria and Somerset counties, and West Virginia.
DISTRICT No. 5.—Ohio, Michigan and Kentucky.
DISTRICT No. 6.—Virginia.

The discount sheet, with other information relating to District No. 1, is as follows:

DISTRICT NO. 1.—DISCOUNTS IN EFFECT DECEMBER 19, 1901.—NEW ENGLAND.

	Per cent.
Standard Pipe, 2-inch to 24-inch	70
Double Strength, 15-inch	65
Double Strength, 18-inch, 20-inch, 24-inch	61
Standard Pipe, 27-inch and 30-inch	60
Double Strength, 27-inch and 30-inch	52

All Pipe in 2½-foot and 3-foot lengths to take 2 per cent. less discount than above, except 27-inch and larger sizes usually made in 2½-foot lengths.

Deep and wide sockets on either Standard or Double Strength Pipe to take 3 per cent. less discount than specified for the various sizes and kinds of Pipe.

Second quality Pipe, 5 per cent. greater discount than same sizes of first quality Standard Pipe.

The discount on Pipe sold for contract work, with breakage and inspection guaranteed, shall be 3 per cent. less than when sold without such guarantee.

Flue Lining, 2½ per cent. greater discount than foregoing prices on first quality Standard Pipe.

Stove Pipe and Thimbles, same discounts as first quality Standard Pipe.

Chimney Tops, 10 per cent. less discount than first quality Standard Pipe.

Wall Coping, same discount as first quality Standard Pipe.

Freight allowed on car lots, except that to points where the rate exceeds 25 cents per 100 pounds from Akron, Ohio, the price should be increased sufficiently to cover the extra cost of freight, figuring that 1 per cent. of the list equals 2 cents per 100 pounds additional freight on Standard Pipe; 2 per cent. of the list equals 3 cents per 100 pounds additional freight for Double Strength Pipe.

Breakage, if any, at risk of purchaser. Terms of payment: 60 days, or 2 per cent. off net bills after deduction of freight for cash within 15 days from date of invoice.

The remaining territory is subject to somewhat larger discounts with slight modifications in the freight allowances on car lots, varying with the district, and on Pipe sold for contract work the amount of the discount increasing as the freight rate decreases. For instance, in District No. 2, New York and New Jersey, the discount on Standard Pipe, 2 to 24 inches, is 73 per cent. In District No. 3, Maryland, &c., the same goods are subject to 75 per cent. discount, with corresponding changes in Double Strength and Standard Pipe of the various dimensions. Freight allowances, &c., also vary with the different districts.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED JANUARY 10, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₱ lb. 37¢
100-lb lots.....₱ lb. 35¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

	6-in	14-in.	24-in.
Wider than.....	14-in	24-in.	30-in.
And including.....	₱ lb	₱ lb.	₱ lb.
Nos. 13 to 19.....	$0.42	$0.44	$0.47
" 20.....	.44	.46	.49
" 21 to 23.....	.46	.48	.51
" 24.....	.46	.50	.53
" 25.....	.47	.51	.54
" 26.....	.47	.54	.59
" 27.....	.48	.57	.62
" 28.....	.48	.57	.64
" 29.....	.49	.60	.69
" 30.....	.50	.64	.77

Note.—Lots of less than 50 lbs 5¢ ₱ lb extra.

Antimony—

Cookson.....₱ lb. 10½@11¢
Hallett's.....₱ lb, 8½@8¾¢
U.S.....₱ lb 8 @8½¢

Brass, Roll and Sheet..... 30%

Conductors—Corrugated.

Round or Square.—

Galvanized ½ or more. N'st'd.....70&5%
" Not Nested.....70&2½%
" Plain Round, ½ or more, Nested.....70&5%
Galvanized, Plain Round, Not Nested.....70&2½%

Spiral Riveted.

Galvanized.....40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—

See *Strainers, Conductor.*

Copper—

Lake Ingot.....14 @14½¢
Casting.....13¾@14 ¢
Sheet and Bolt.....18¢ ₱ lb basis
Cold Rolled Sheets.....19¢ ₱ lb basis
Cold Roiled and Polished Sheets.....20¢ basis
Planished Sheets.....21¢ basis
Bottoms, Pits and Flats....₱ lb 22¢ basis

Eave Trough, Galvanized

Territory.	L. C. L.	
Eastern	75&10%	Carloads extra 12½%
Central	75&7½%	
Southern	70&12½%	
S. Western	70&10%	

Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Eastern List.

Tin.....30%
Galvanized.....30%
Perfect Elbows.....40%

Stove Pipe—

Four-Piece

	4	4½	5	5½	6-Inch.
No. 1.	60	.85	.90	1.00	1.05 per doz.
No. 2.	.65	.70	.75	.80	.85 "
No 3.	.60	.63	.65	.70	.80 "

Elbows and Shoes—

Galvanized.....60%

Gasoline—

See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, C. R., Soft Steel.	R. G. Cleaned.
Nos. 14 to 16....	₱ lb. 3.65	3.70¢
Nos. 18 to 21....	₱ lb. 3.75	3.80¢
Nos. 22 to 24....	₱ lb. 3.85	3.90¢
Nos. 25 and 26...	₱ lb, 3.95	4.00¢
No. 27....	₱ lb, 4.05	4. 0¢
No. 28.....	₱ lb, 4.15	4.20¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₱ lb 11@14 ¢
Do. Stained.....0@10½¢
Patent Planished. ₱ lb A, 12¢; B, 11¢ net

Galvanized.

Nos. 10 to 16	₱ lb, 12¢	65@67½% off
Nos. 17 to 21	₱ lb, 13¢	
Nos. 22 to 24	₱ lb, 14¢	
Nos. 25 to 26	₱ lb, 15¢	
No. 27	₱ lb, 16¢	
No. 28	₱ lb, 17¢	
No. 29	₱ lb, 19¢	
No. 30	₱ lb, 21¢	

86 la. 1¢ ₱ lb higher.

Lead—

American Pig.....4.15@4½¢
Bar.....5@5½¢
Pipe.....6½¢.....2½ off
Tin Lined Pipe.....12½¢.....20% off
Block Tin Pipe.....37½¢.....20% off
Sheet Lead, full rolls... 7½¢ .....20% off
Sheet Lead, cut.....7¾¢.....20% off
Old Lead in exchange, 1¢ ₱ lb.

Mitres, Eave Trough—

See *Eave Trough Mitres.*

Nickel—

Per lb.....60@65¢

Paints, Oils, &c.—Leads—

Lead, American White, in Oil:
Lots of 500 lb or over.....6¼ @ 6½
Lots less than 500 lb.....6¾ @ 0¼
Lead, White, in oil, 25 lb tin pails, add to keg price..... @ ½
Leao, white, in oil, 12½ lb tin pails, add to keg price..... @ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price.. @ 1½
Lead, White, Dry in bbls.....5¾ @ 6
Lead, Red, bbls., ½ bbls. and kegs:
Lots 500 lb or over..... @ 0
Lots less than 500 lb..... @ 0½

Oils—

Linseed, City, raw.....₱ gal.....62@63¢
Linseed, City, boiled.....64@65¢
Linseed State and West'n, raw..60@61¢

Spirits Turpentine—

In Southern bbls.....38½@39 ¢
In machine bbls.....40 @40½¢

Putty—

In bulk.....$1.25
In bladders.....2.25
In cans 12 lb to 25 lb.....2.25
In cans 1 lb to 5 lb.....3.25

Petroleum Products—

In Barrels (Barrel included)

Stove Gasoline.....₱ gal. 10½@11¢
Kerosene.....₱ gal. 12@13¢

Pipe, Drain..... 40%

Pipe, Spiral—

See *Conductors.*

Registers—

List Sept. 2, 1901.

Black Japanned.....6%&10@60&10&5%
White Japanned.....6%&10@60&10&5%
Nickel Plated.....6%&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....60&10@60&10&5%
Electroplate in Brass, Bronze or Copper.....60&10@60&10&5%
White Porcelain.....60%
Solid Brass and Bronze Metal.....50%

Roofing Material—

1 Ply Tarred Paper, ₱ ton.$28.00@30.00
2 Ply Tarred Paper...₱ roll, 108 sq. ft. 50@55¢
3 Ply Tarred Paper..₱ roll, 108 sq. ft. 75@80¢
Slater's Felt.....roll 500 sq. ft., 50@60¢
Roofing Pitch.....₱ bbl. $2 38

Rosin—

Common and Good—Strained.

Rosin. C. & D....	₱ bbl. $1.50	@$1.55
Rosin, E. & F....	₱ bbl. 1.60	@ 1.65
Rosin, G. & H	₱ bbl. 1.70	@ 1.75
Rosin, I. & K	₱ bbl. 1.80	@ 2.40
Rosin, M. & N.....	₱ bbl. 2.90	@ 3.50

Shoes and Elbows—

See *Elbows and Shoes.*

Slate Roofing—

f. o. b. cars, Quarry Station.

	According to size.
Pennsylvania:	
Best Bangor, ₱ sqr.	$3.25@$4.50
No. 1 Bangor Ribbon, ₱ sq	3.00@ 3.50
Pen Argyle, ₱ sqr.	3.00@ 3.75
Peach Bottom, ₱ sqr.	4.85@ 5.00
No. 1 Boys, ₱ sqr.	3.35@ 3.55
No 1 Chapman Keystone ₱ sqr.	3.25@ 4.25
Vermont:	
Sea Green, ₱ sqr.	$2.00@$3.15
Purple, ₱ sqr	3.75@ 4.25
Unfading Green, ₱ sqr...	3.25@ 4.50
Red, ₱ sqr.	0.50@11.00
Maine:	
Brownville, Unfading Black:	
No. 1 quality	$5.25@7.50
No. 2 quality	$4.25@6.00

Solder—

½&½ guaranteed..... 10½@17¢
No. 1.....11@13½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	Per Pound. Barrels	Smaller Q'ntities
Concentrated Flux	4c	5c
Eureka Flux:		
Triple Strength...	3c	3½c
Extra Concentrated	4½c	5c
Crystal	..	7c
Gedney's Fluid	2c	2c
Lennox Fluid	2c	3c
Perfection Flux	3c	3½@4c

Yager's Salts, 1 lb. bottles.....each, 50¢
5 lb. bottles, per lb., 45¢

Soldering Coppers—

Per lb.....20@22¢

Spelter—

Western Spelter.....4½@4¾¢

Spiral Pipe—

See *Conductors.*

Stove Pipe Elbows—

See *Elbows, Stove Pipe.*

Stove Trucks—

See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....50%

Tin Pigs and Bars—

Banca, pigs, ₱ lb.....24½@24¾¢
Straits, pigs, ₱ lb.....24½@24¾¢
Straits, in bars, ₱ lb.....25¾@26¾¢

Tin Plates, American Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:

IC.	14 x 20	$7.50
IX.	14 x 20	9.00
IXX.	14 x 20	10.25
IXXX.	14 x 20	11.50
IXXXX.	14 x 20	12.75

Melyn Grade:

IC.	14 x 20	7.00
IX.	14 x 20	8.50
IXX.	14 x 20	9.75
IXXX.	14 x 20	11.00
IXXXX.	14 x 20	12.25

Allaway Grade:

IC.	14 x 20	6.50
IX.	14 x 20	7.60
IXX.	14 x 20	8.70
IXXX.	14 x 20	9.80
IXXXX.	14 x 20.	10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight: IC, 14 x 20.....$5.00@5.25
" " IX, 14 x 20.....$6.00@6.25

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb	15¢
95 lb	20¢
90 lb	25¢
85 lb	30¢

Terne Plates—

N. B.—The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance for 8 to 10 lb coating and $2.50 to $3 advance for 15 lb and upward.

About 40 lb coating.....$16.00@16.50
About 30 lb coating.....15.25@15.75
About 20 lb coating.....13.25@13.75
About 15 lb coating.....11.25@11.75
About 8 lb coating.....@10.00

Boiler Plates, American—

IXX, 14 x 28..(112 sheets).....$12.50
IXX, 14 x 28..(112 sheets).....13.50
IXX, 14 x 31..(112 sheets).....15.00

Troughs, Eave—

See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved pattern, ₱ doz...18.00

Tubes and Tubing—

Brazed Brass, List June 6, 1898.....40%
Copper and Bronze, 3c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb. 6, 1899.
Tin.....50%
Galvanized.....50%
Fittings for do.....40%

Zinc—

600 lb casks ₱ lb.....6¾¢
Per lb.....7¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
30 gal.....70&10%
35 and 40 gal.....70%
Other sizes up to 52 gal....60@00&10%
52 gal. and above.....60%
Extra Heavy Boilers:
18 to 52 gal.....60%
53 gal. and above.....55%

Brass Work, Plumbers'—

List of December 7, 1896.

Compression:
Basin Cocks.....60%
Bath Cocks and Double Bath Cocks..65%
Bibs.....05%
Bibs, Flanged.....05%
Fuller:
Bibs.....70%
Basin Cocks, Nos. 1 to 4.....70%
Bath Cocks, No. 4½.....$2.40 each net
Ground Key Work:
Finished Bibs.....55&5%
Rough Bibs and Stops.....70%
Rough Stop and Stop and Waste Cocks.....70@70&5%
Rough Stop and Stop and Waste Cocks, Patented.....65@65&5%

Miscellaneous—

Basin Clamps.....60@65%
Basin Plugs.....60@65%
Chain Stays.....60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face..₱ set	$0.95	$1.05
Ground Face ₱ set	$1.00	$1.10

Sink or Bath and Wash Tray Plugs.60@65%
Soldering Nipples.....70&5@75%
Soldering Unions.....70&5@75%
Union Elbows, Hot Water Heating.....75@75&15%

Cocks, Valves, &c.—Cocks—Brass—

Air and Radiator Air.....75@75&5%
Gas Meter and Union Meter.....65@70%
Steam.....65@70%

Iron—

All Iron.....70@70&10%
Iron with Brass Plugs.....65@70%

Valves—Brass—

Check.....65@70%
Garden Hose.....05&10@70%
Gate.....05@05&10%
Globe and Angle, hose outlet.05@05&10%
Globe, Angle and Cross..65&10@70&5%
Horizontal, Vertical and Angle Check...65@05&10%
Hot Water Radiator.....75%
Radiator.....70&10%
Safety.....65%
Safety, Low Pressure.....65%
Jenkins' Disc:
Check.....65%
Gate.....65%
Globe, Angle and Cross.....70%
Radiator.....80%
Radiator, Corner.....75%
Safety.....65%

Iron—

Iron Body.....70@70&5%
Foot.....65@70%
Jenkins Bros.':
All Iron, except Gate.....40&5%
All Iron Gate.....35@40%
Iron Body, except Gate.....60%
Iron Body Gate.....50@50&5%
Swing Check.....50%

Earthenware—

Brown Glazed.....20%

Porcelain, List of Aug. 15, 1901: Class
Basins, Urinals and Hoppers.... A, 30%
Closet Bowls, Sundries, Washouts and Pedestals..... B, 40%
C, 50%

Fittings—Brass Fittings—

Finished.....70@75%
Rough.....70@75%
Bushings.....70@75%
Nipples.....70@70&2½%
Unions, Rough and Finished....70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....65@70%
Cast Iron Bushings and Plugs....05@75%
Cast Iron Flanges.....65@70%
Cast Iron Floor Flanges.....65@75%
Malleable Iron Fittings.....70@ 75%
" " Bushings.....70@70&10%
" " Unions.....70&10@75%
" " Unions, Flange 00&10@70%
" " Pipe Hangers, Universal 50%
Wrought Iron Nipples.....70@75%
" " Couplings.....60@65%
" " Long Screws.....60@65%

Lavatories—

Porcelain Enameled Iron.....80@80&10%

Oakum—

Plumbers' Oakum, 50 lb. bales, ₱ lb 2½¢

Pipe—Brass, Iron Pipe Size—

⅛	¼	⅜	½ to 3 Inch
$0.33	.34	.29	.23 ₱ lb

Cast Iron Soil—

List Feb 25, 1901.
2 to 6 inch inclusive.

Standard.....00@60&10%
Extra Heavy.....05@70%
All Fittings.....70@75%

Wrought Iron—

List Feb. 15, 1900.

	Black.	Galv.
⅛ to ⅜ inch	57%	43%
½ to 12 inch	64%	51%

NOTE.—*Manufacturers' prices are much lower than above, but prompt shipments are not obtainable.*

Radiators—Standard List.

Steam.....50&2½%
Hot Water.....50%

Sinks, Etc.—Cast Iron—

	Black.	Galv.
Sinks, Square, Half Round and Corner	05@05%	00@05%
Sink Legs	60%	60@65%
Sink Backs	60%	60@65%
Boiler Stands, Cast Iron	60@60&10%	
Cesspools, Cast Iron	60%	

Wrought Steel Sinks—

New Era, Galv'd and Enameled...70&5%
New Era, Painted.....50&10%
L. & G.....50%

Traps—

Drawn Lead Traps, List June 8, 1901.....50@50&10%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns, Guaranteed, 45@50%
All Special Patterns.....25%
Non-guaranteed Brands, complete line.....45@50%
Solid Copper, list of Feb. 1, 1899.....40%
Solid Porcelain—Class A, 30%; B, 40%; C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899.....45@50%

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Æolipyle Co. 17
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American Radiator Co. 11
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Asphalt Ready Roofing Co .. 69
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Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Swaine, F. J. Co., St. Louis, Mo.

Presswork.
Kirk Mfg. Co., Toledo, O.

Pumps.
Lawless, John H., Jersey City, N. J.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Toledo Mach. & Tool Co., Toledo, O.

Radiators, Hot Air.
Burton, W. J. & Co., Detroit, Mich.
Independent Register Co., Cleveland, Ohio.

Radiators, Steam and Hot Water.
American Radiator Co., Chicago, Ill.
Gurney Heater Mfg. Co., Boston, Mass.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.

Range Boilers.
Koven, L. O. & Bro., 50 Cliff St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

Refrigerators.
Challenge Refrigerator Co., Grand Haven, Mich.
Wisconsin Refrigerator Co., Eau Claire, Wis.

Registers.
Canton Steel Roofing Co., Canton, O.
Dighton Furnace Co., Taunton, Mass.
Independent Register Co., Cleveland, Ohio.
Seavey Mfg. Co., Boston, Mass.

Runsters and Bnkers.
Shepard, Sidney & Co., Buffalo, N. Y

Roofing.
Asphalt Ready Roofing Co., 136 Water St., N. Y

Roofing Cement and Paint.
Callahan, Geo. & Co., 218 Front Street, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Roofing Cork.
Stowell Mfg. Co., Jersey City, N. J.

Roofing Edger.
Danzer Metal Works, Hagerstown, Md.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
Berger Mfg. Co., Canton, O.
Burton, W. J. & Co., Detroit, Mich
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Co., Cleveland, O.
Gummey McFarland & Co., Phila., Pa.
New York Iron Roofing & Cor Co., Jersey City, N. J.

Roofing Nails.
Salem Nail Co., 279 Pearl St., N. Y.

Roofing Slate.
Bray, J. & Co., E. Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Genuine Bangor Slate Co., Boston, Pa.
Johnson, E. J. & Co., 78 Park Row N. Y.
O'Halloran & Jacobs, Pittsburgh, Pa.

Sap Spouts.
Millar, C. & Son Co., Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.

Screens.
Harrington & King Perforating Co., Chicago, Ill.

Shears, Sheet Metal
Mesberry, Chas., Pittsburgh, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn
Double Truss Cornice Brake Co., Buffalo, N. Y.
Excelsior Tool & Mch. Works, St. Louis, Mo.
Keene, Geo. C. & Co., Cincinnati, O.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, F. J. Co., St. Louis, Mo.

Sheets, Galvanized.
American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
McClure & Co., Pittsburgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Alan Co., Philadelphia, Pa.

Sheets, Iron and Steel.
American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Co., Alan Philadelphia, Pa.

Shingles and Tiles, Metallic.
Cincinnati Stamping Co., Cincinnati, O.
Corbright Metal Roofing Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Siding. *(See Roofing and Siding.)*

Sinks.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.

Skylights.
Canton Steel Roofing Co., Canton, O.
Drouve, G. Co., Bridgeport, Conn.
Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 279 Pearl St., N. Y.

Smoke Test Machine.
Gunster & Forsyth, Scranton, Pa.

Snow Guards.
Mason Arch. Metal Works, Providence, R. I.

Solder.
Bruce & Cook, 186 to 190 Water St., NY
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Burgess Soldering Furnace Co., Columbus, Ohio.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties, Sheet Metal.
Vogel, Wm. & Bros., Brooklyn, N. Y.

Steam and Gas Fitters' Supplies.
Curtis & Curtis Co., Bridgeport, Conn.
Walworth Mfg. Co., Boston, Mass.

Steam and Water Engineering and Regulating Specialties.
Kieley & Mueller, 7,11 West 13th St., N. Y.

Steel Shapes.
Cambridge Rolling Mill Co., Cambridge, Ohio.

Steel Stamps and Stencil Dies.
Schwerdtle Stamp Co., Bridgeport, Ct.

Stove Bands.
Kirk Mfg. Co., Toledo, O.

Stove Cement.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.
Hoffman, Geo. W., Indianapolis, Ind.
Rutland Fire Clay Co., Rutland, Vt.

Stove Patterns.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Milwaukee Pattern Works, Milwaukee, Wis.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.
City Forge & Iron Works, Dayton, O.

Stove Repairs.
Clark, Henry N. Co., Boston, Mass.
Howes, S. M. Co., Boston, Mass.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
Fanner Mfg. Co., Cleveland, O.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Howes, S. M. Co., Boston, Mass.

Stoves and Ranges.
Barstow Stove Co., Providence, R. I.
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Brand Stove Co., Milwaukee, Wis.
Bucks Stove & Range Co., St. Louis, Mo.
Detroit Stove Works, Detroit, Mich.
Dighton Furnace Co., Taunton, Mass
Eclipse Stove Co., Mansfield, O.
Enterprise Stove Co., Vincennes, Ind.
Floyd, Wells & Co., Royersford, Pa.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co., Utica, N. Y.
Graff Furnace Co., 208 Water Street New York.
Gurney & Co., Boston, Mass.
Magee Furnace Co., Boston, Mass.
Quincy Fdry. & Novelty Co., Quincy, Ill.
Richmond Stove Co., Norwich, Conn.
Schneider & Trenkamp Co., Cleveland, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Smith & Anthony Co., Boston, Mass.
Stamford Foundry Co., Stamford, Ct.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
Detroit Stove Works, Detroit, Mich.
Dighton Furnace Co., Taunton, Mass.
Monarch Stove & Mfg. Co., Mansfield, Ohio.

Stoves and Ranges, Oil, Vapor and Gasoline.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Schneider & Trenkamp Co., Cleveland, O
Taylor & Boggis Foundry Co., Cleveland, O.

Street Lamps, Gasolene.
Merkel, H., St. Louis, Mo.

Tank Heaters.
American Radiator Co., Chicago, Ill.

Tanks, Steel and Wood.
Edwards, J. H., 59 Park Place, N. Y.

Terne Plates.
American Tin Plate Co., New York.
Taylor, N. & G. Co., Phila., Pa.

Tinners' Tools, Machines and Supplies.
Berger, L. D., Philadelphia, Pa.
Berger Bros. Co., Phila., Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. O. & Co., Cincinnati, O.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn N. Y.
Weiss, H. & Co., 20 Cliff St., N. Y.

Tinners' Trimmings.
Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate.
American Tin Plate Co., New York.
Berger, L. D., Philadelphia, Pa.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

Tin Scrap.
Vulcan Metal Refining Co., 157 Cedar St., N. Y.
Vulcan Western Co., Streator, Ill.

Tinware.
Shepard, Sidney & Co., Buffalo, N. Y.

Tools and Machines, Steam and Gas Fitters'.
Curtis & Curtis Co., Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Torches, Plumbers.
Clayton & Lambert Mfg. Co., Detroit, Mich.

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Crosby Steam Gage & Valve Co., Boston, Mass.
Jenkins Bros., 71 John St., New York.
Morgan & Co., Chicago.

Ventilators and Chimney Caps.
Berger Bros. Co., Phila., Pa.
Dowman Mfg. Co., Atlanta, Ga.
Fenn, Geo. E., Boston, Mass.
Globe Ventilator Co., Troy, N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, O.
Marston, I. G. & Co., Boston, Mass.

Washing Machines.
Wayne, Anthony Mfg. Co., Ft. Wayne, Ind.

Water Coolers.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Water Fronts.
Clark, Henry N. Co., Boston, Mass.

Water Heaters.
Adam, W. J., Joliet, Ill.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.
Miner & Peck Mfg. Co., New Haven, Ct.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Official letters of reference should not be inclosed with replies to advertisements appearing in these columns as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

SALESMAN familiar with the stove trade to travel in general territory on salary and commission. "Salesman," care *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Jan. 11

A good, honest and temperate TINSMITH to work for me, to commence work March 1, 1902; please state age and experience, also give reference. H. H. Dutton, Burlington Flats, N. Y. Jan. 11

First-class PLUMBER, TIN and SHEET IRON WORKER with some knowledge of steam and hot water heating; good wages and steady job to the right party. A. P. Bateman & Son, Winchendon, Mass. Jan. 11

PLUMBER with some knowledge of tinsmithing; settled man with some means to take an interest preferred. Georgetown Hardware & Plumbing Company, Georgetown, S. C. Jan. 11

FOREMAN; first-class cornice maker and sheet iron worker, capable of cutting patterns and laying out work, to take charge of our cornice shop; state age, experience, salary wanted, also references. Duluth Corrugating & Roofing Company, Duluth, Minn. Jan. 11

Men skilled in metal working, also forming, who are capable of shaping sheet iron, in a shop using bending machines and other improved methods. "Modern," care *The Metal Worker*, New York. Jan. 11

At once, two BENCH and 12 FLOOR MOLDERS; stove plate; steady work year round for good, sober men; increasing force, no trouble. The W. J. Loth Stove Company, Waynesboro, Va. Jan. 11

Experienced and competent STOVE and RANGE SALESMAN, acquainted with territory, to sell the Eclipse line in State of New York. Eclipse Stove Company, Mansfield, Ohio. Jan. 11

A first-class TINNER and SHEET IRON WORKER who also understands plumbing; must be sober and steady; work the year round; German preferred; state experience and reference, also wages wanted. Valentin Weidig, Unionville, Conn. Jan. 11

A good CORNICEMAN and a good TINNER, who understands hot air and blow pipe work. John H. Scharer, 2025 Canton avenue, Toledo, Ohio. Jan. 11

For a country shop about 30 miles from New York City, a first-class TINSMITH; must be steady and strictly sober; one that can cut his own patterns, make furnace casings and fittings and erect them in a first-class manner, also competent to do anything that comes to a first-class shop; state age, married or single, and wages wanted. "Tin," care *The Metal Worker*, New York. Jan. 11

A situation is open for a first-class MOLDER; not over 40 years of age; competent to act as assistant foreman in a foundry making ranges, furnaces and hot water or steam boilers; state wages expected and give references. "Range," care *The Metal Worker*, New York. Jan. 4

Two first-class TINNERS and SHEET IRON WORKERS; must be sober and strictly business; wages $2 to $2.50 per day. A. J. Shide, 103 South Forsyth street, Atlanta, Ga. Jan. 4

STOVE SALESMAN; state age, experience and salary wanted. Danville Stove & Mfg. Company, Pittsburgh, Pa. Jan. 4

SALESMEN for Maryland, Delaware and Atlantic Coast States who are acquainted with trade on gasoline stoves, oil stoves and ovens for 1902. "Atlantic Coast," care *The Metal Worker*, New York. Jan. 4

An all around man for country shop; married man preferred; to the right man the job will be steady by the year; would rather have man to stay five years than one; wages $11 per week; rent and living cheap. Wm. C. Cook, Branchville, N. J. Jan. 4

Experienced, steady, industrious man, first mechanic in stove, tin and sheet iron shop. "X. M. O.," Lock Box 107, Rondout, N. Y. Jan. 4

Bright young men, unmarried, who would like to learn the tin and sheet iron business; those with some knowledge of the business preferred; steady work and advancement according to ability; young men who would be willing to learn to erect work on the road. Apply to Box 428, Hartford, Conn. Jan. 4

A first-class WOOD PATTERN MAKER, capable of taking charge of the work in a large stove shop can learn of good opportunity by addressing "Pattern Shop," care *The Metal Worker*, New York. Jan. 4

Competent man as SUPERINTENDENT of stove factory producing sheet steel and cast goods; must be able to handle men and one who has good mechanical ideas. Box 196, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Jan. 4

JAPANNER who is thoroughly accustomed to mixing colors for tin work; must also understand cutting, stencils and decorating general line of tinware; state experience, references, age and salary expected. "B. A.," care *The Metal Worker*, New York. Jan. 4

An intelligent SALESMAN, familiar with the hardware and house furnishing trade in Wisconsin and Minnesota, to represent a leading manufacturer. "Northwest," care *The Metal Worker*, New York. Jan. 4

Four CORNICE MAKERS and four TINNERS; steady work the year round to first-class men. Duluth Corrugating & Roofing Company, Duluth, Minn. Jan. 4

SITUATIONS WANTED.

By young man of good habits as second man in tin and furnace shop to finish trade; good references. Lock Box 623, Auburn, Ind. Jan. 11

A STEADY JOB by A1 TINSMITH and SHEET IRON WORK; would take charge of tinsmithing department of factory; 18 years' experience, two years as foreman; strictly temperate and reliable; first-class references; can also do furnace work and electroplating. "Mechanic," 1372 Brook avenue, New York. Jan. 11

TINSMITH and SHEET IRON WORKER; 18 years' experience; wishes steady employment. Ph. Luck, 503 West Thirty-seventh street, New York. Jan. 11

TINNER and ROOFER, good all around man, wishes steady position. Karl Stark, 522 Tenth avenue, New York. Jan. 11

As PLUMBER and GAS FITTER; nine years' practical experience in a general line of plumbing work; temperate and reliable; reference; no tin work. John J. McMullen, 188 Straight street, Paterson, N. J. Jan. 11

Hustling young man with ten years' experience would like position in retail hardware and stove store; thoroughly familiar with prices; A1 references. Box 341, Taunton, Mass. Jan. 11

By a competent and industrious young man of 22 years, a position as SHIPPER or SALESMAN; have had six years' experience with an old Philadelphia foundry, by whom I am now employed and can give as reference; understand stove and range business thoroughly and am capable of managing shipping department. "D. E. A.," 1618 South Sixth street, Philadelphia, Pa. Jan. 11

By experienced TRAVELING SALESMAN, ten years in Pennsylvania and New Jersey trade, as stove and furnace salesman; desire to connect with first-class house; reference as to character and ability. "W.," care *The Metal Worker*, New York. Jan. 11

By a practical PLUMBER and STEAM FITTER; 12 years' experience I can estimate from plans, draft and plan work, capable of taking charge of work; a neat and quick lead worker, a hustler and up to date; strictly temperate in habits; best of reference furnished; correspondence solicited for a steady position only; will go to work in any first-class shop on trial. Call Box 692, Glens Falls, N. Y. Jan. 11

As SALESMAN in any line of metal work; good address, tact and energy, thorough knowledge of manufacturing; small experience on road; first-class references from reliable firm. "Salem," care *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Jan. 11

First-class mechanic, understanding various branches of metal trade, as FOREMAN or SUPERINTENDENT; experienced in handling men; best of references as to character and ability; especially qualified in manufacturing of hardware and kindred lines; 32 years old. "Qualified," care *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Jan. 11

A practical SHEET METAL WORKER of 25 years' experience, with some knowledge of mechanical engineering and a practical knowledge of heating and ventilating problems, desires position. Address Box 190, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Jan. 11

Practical MECHANIC and SALESMAN, understanding full details such as laying out work, making specifications and plans for steam and water heating and high pressure work; 21 years' experience; married man, will accept a position with any responsible firm that will acknowledge ability. "Circulation," care *The Metal Worker*, New York. Jan. 11

By a young married man with three years' experience at the tinner's trade; can do slate roofing; would like chance to finish trade in Ohio or Illinois; can furnish references; state wages. E. W. Hiatt, 520 Penn street, Muncie, Ind. Jan. 11

PLUMBER; ten years' experience; wages moderate; reference furnished. "B. L.," care *The Metal Worker*, New York.

By SALESMAN for steam, hot water and hot air heaters, having a wide acquaintance with New England trade; is open to engagement for 1902; expert engineer, good business ability; references furnished; state territory and other requirements. "S. and H. W.," care *The Metal Worker*, 70 Kilby street, Boston, Mass. Jan. 11

By engineer, practical experience of 14 years with all kinds of heating and plumbing systems, good draftsman, good executive ability, would go anywhere; competent to act as MANAGER, ENGINEER or SUPERINTENDENT; references furnished; state location and number of men employed. "H. and P.," care *The Metal Worker*, 70 Kilby street, Boston, Mass. Jan. 11

By first-class TINNER and SLATER; 11 years' experience; $2 per day for regular work; strictly sober and reliable; references furnished. G. M. Hooper, Springfield, Tenn. Jan. 11

As TRAVELING SALESMAN or MANAGER of retail store; 12 years' experience in retail hardware, plumbing and steam fitting; seven years' road experience, calling on the stove trade in Central and Eastern New York and part of New England; A1 references. "Eastern," care *The Metal Worker*, New York. Jan. 11

As FOREMAN, by a first-class, up to date steel range maker, with all the latest idea of tools for the construction of cooks and ranges; strictly temperate and references A1. Box 1, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Jan. 11

By a first-class MECHANIC in sheet metal work, cornice work preferred; can cut any kind of patterns; have an experience of 36 years in cutting and putting up work; strictly sober. Box 2, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Jan. 11

By an all round man who understands plumbing and tinsmithing; steady position desired; strictly temperate. E. Harding, 10 Cherry street, Glens Falls, N. Y. Jan. 11

By a RETINNER who understands the retinning of all kinds of sheet and hollow ware, also all kinds of gray, cast and malleable iron, copper and brass ware. John J. Dwyer, 123 Navy street, Brooklyn, N. Y. Jan. 11

By a TINNER and a good SLATER; understand hot air heating and draft my own patterns; am a first-class, sober and reliable man. C. L. Summerson, Kinsman, Ohio. Jan. 4

By a practical, energetic, up to date CORNICE and skylight maker as WORKING FOREMAN with reliable firm that wants good work. Thomas Mack, 180 South Second street, Brooklyn, N. Y. Jan. 4

By a first-class CYLINDER MAKER; large experience in round work; South preferred. "C. A.," care *The Metal Worker*, New York. Jan. 4

CONSTRUCTION ENGINEER wants a steady position; thoroughly competent upon heating, steam or hot water, of the various systems; understand plans and specifications; can estimate, lay out, take full charge of heating department; reference; 20 years' experience. "Steam," care *The Metal Worker*, New York. Jan. 4

By TINSMITH and ROOFER. L. Kronovitz, 404 East Tenth street, New York. Jan. 4

By a sober and steady PLUMBER with ten years' experience; city or country. Thomas Kerwin, 328 East Sixtieth street, New York. Jan. 4

SALESMAN or OFFICE MAN wishes situation in office or on the road; 12 years' experience in metal line. "F. A. L.," care *The Metal Worker*, New York. Jan. 4

By an all round TINNER; inside, outside and furnace work; 25 years' experience; single. Chas. Dutcher, 751 Superior street, Cleveland, Ohio. Jan. 4

By a TIN and SHEET IRON WORKER; any kind; piece or day, or general jobbing shop. "Smith," 51 Third avenue, New York. Jan. 4

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Stock consists of full line of Builders' Hardware, House Furnishing Goods, Paints and Glass, invoicing $12,000 to $15,000. Located on main business street in 32d ward, Pittsburg. For particulars address C. J. AMMANN, 57 Shiloh Street, Pittsburg, Pa.

Exceptional Opportunity.

A young man with $2,000 who thoroughly understands the Cornice business, can hear of a first-class opening by addressing

"BUSINESS,"

Care *The Metal Worker*, 70 Kilby St., Boston, Mass.

A GOOD CHANCE

For a man with small amount of cash to buy an old established Housefurnishing, Tin, Hardware, and Stove business, of 40 years' standing. Tin and Plumbing shop can be added. Just the place for a good, practical man. 7000 inhabitants. Manufacturing town and growing.

Address BOX 157,
Hoosick Falls, N. Y.

For Sale.

In a small but healthy town in New Jersey, 24 miles from New York City, with plenty of business surrounding, a fine equipped Tin and Sheet Metal shop with splendid real estate At a reasonable price. Best opportunity to add plumbing. Water mains will soon be laid. Little opposition to the right man. Owner established business 15 years ago and conducted it successfully, but wishes to devote his time to other business on hand. Capital necessary $3,000.

Address "PATENTEE,"
Care *The Metal Worker*, New York.

FOR SALE.

A new $200 8 foot Cornice Brake, Ohl & Co.'s make, now in storage at Richmond, Va., price $165 O.B.C. Address

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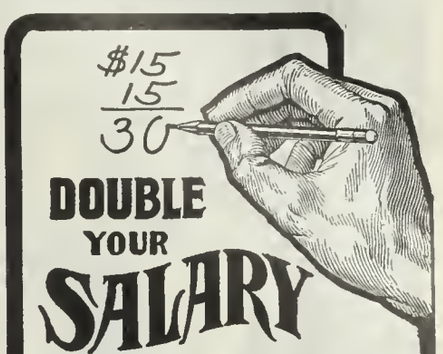
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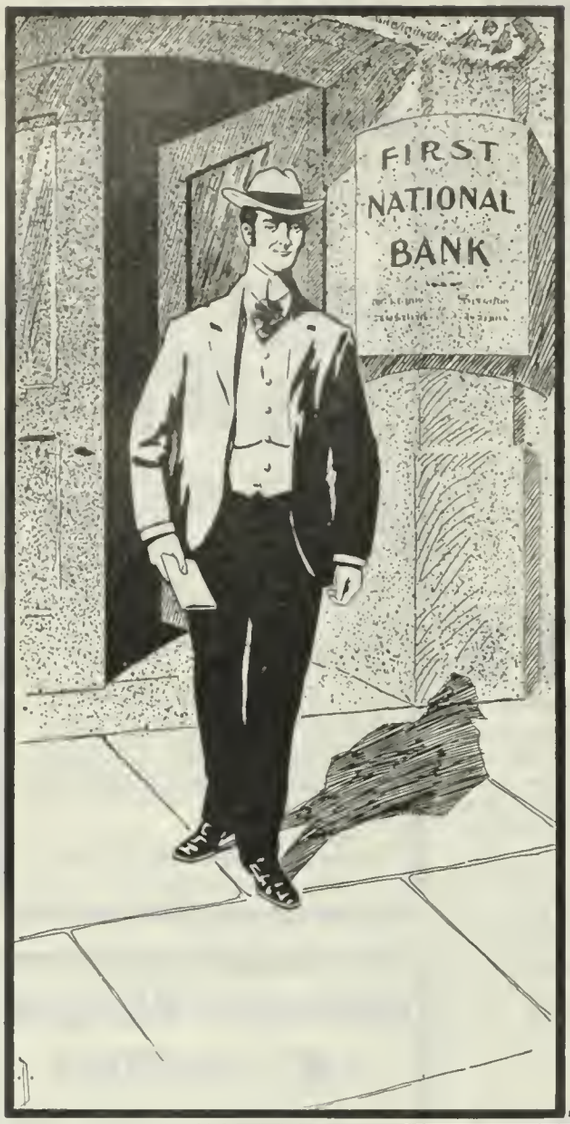
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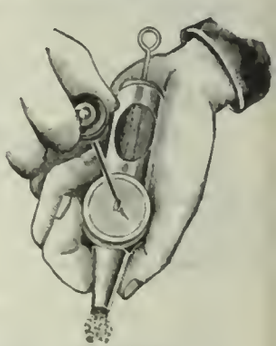
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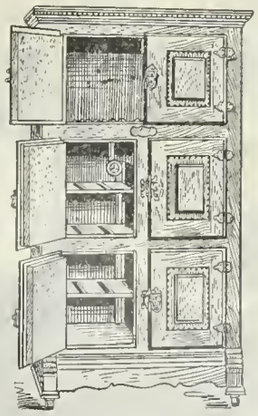
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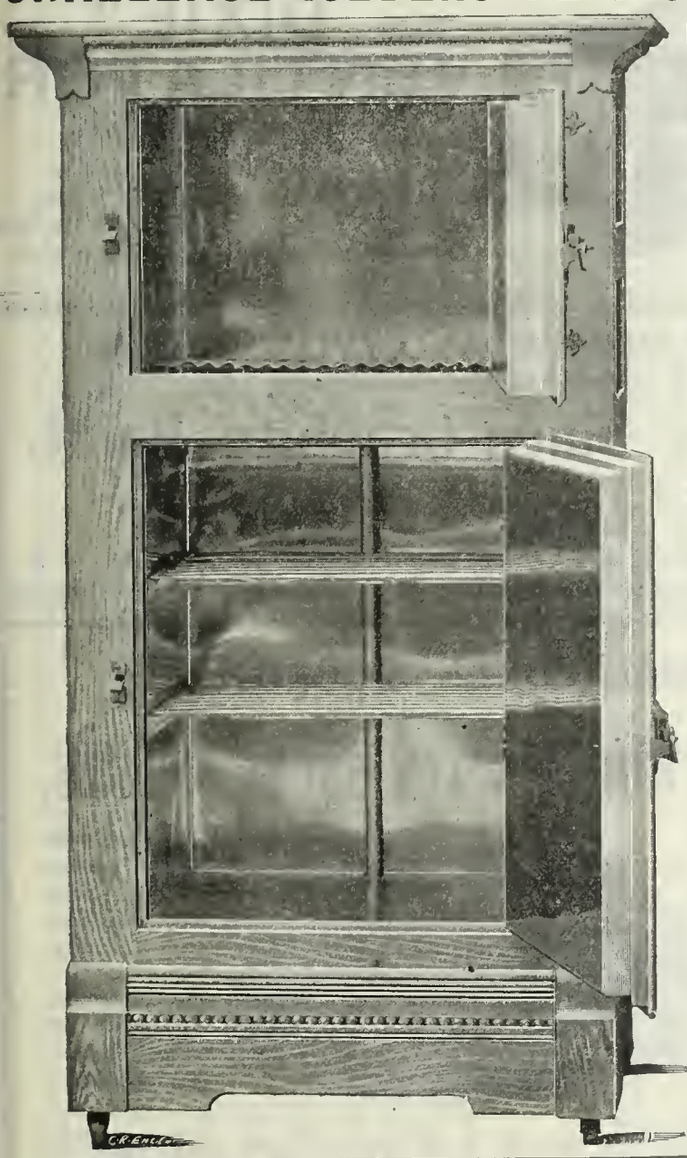
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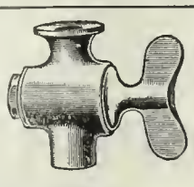
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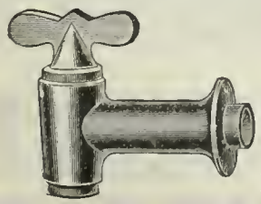
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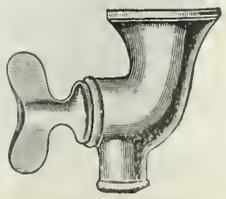
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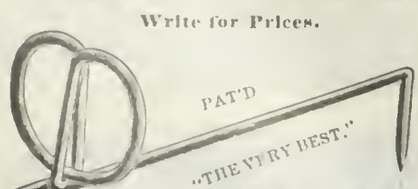
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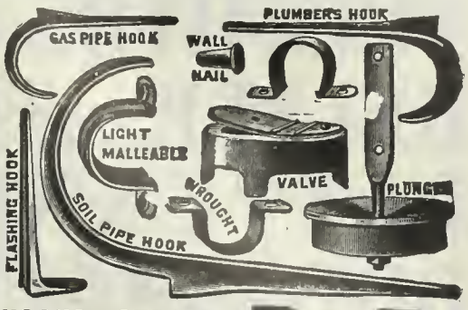
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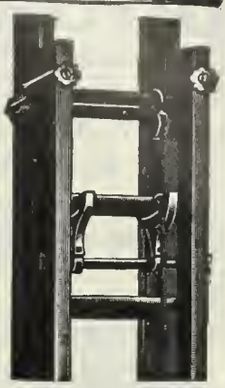
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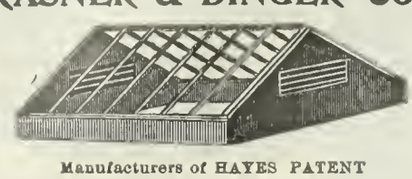
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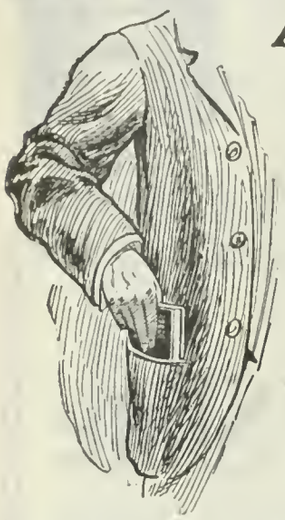
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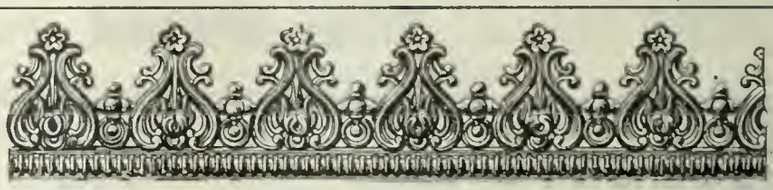
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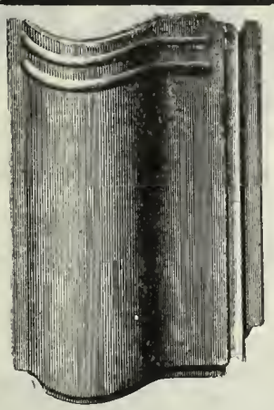
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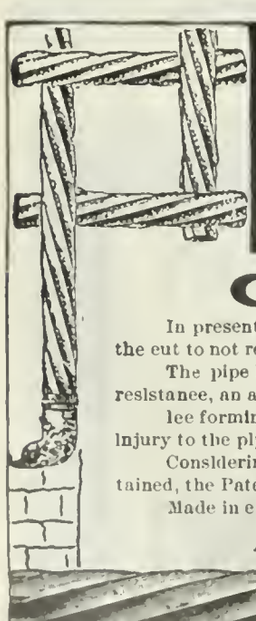
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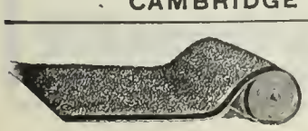
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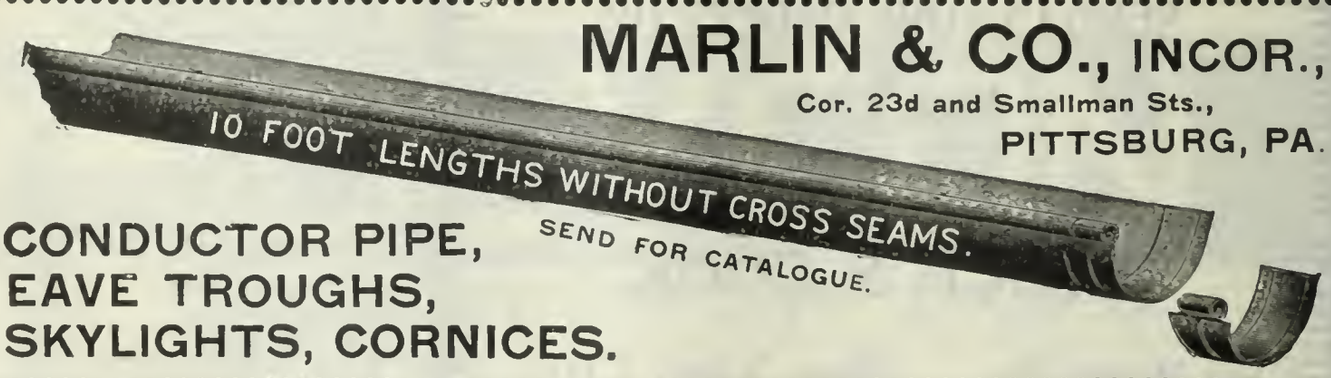
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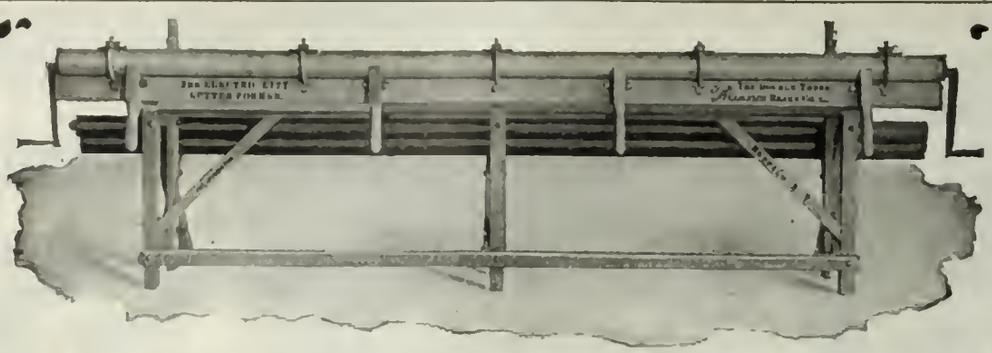
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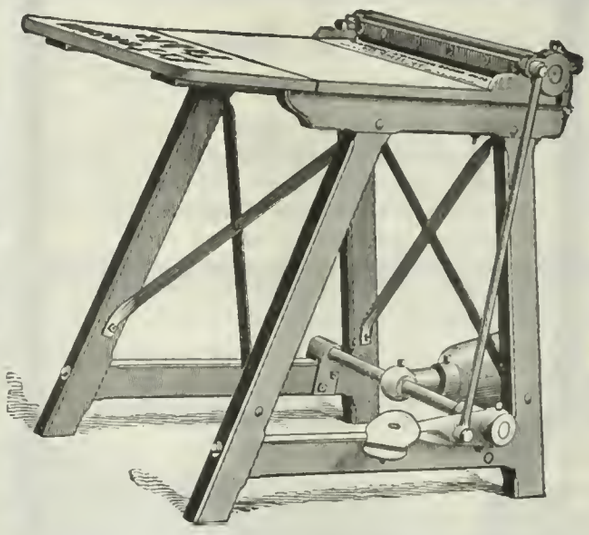
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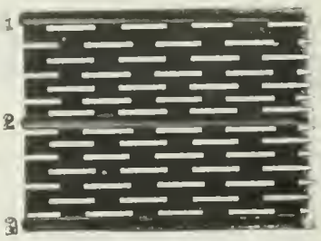
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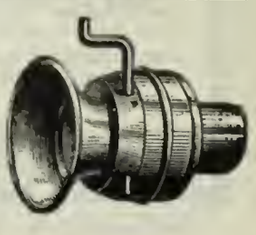
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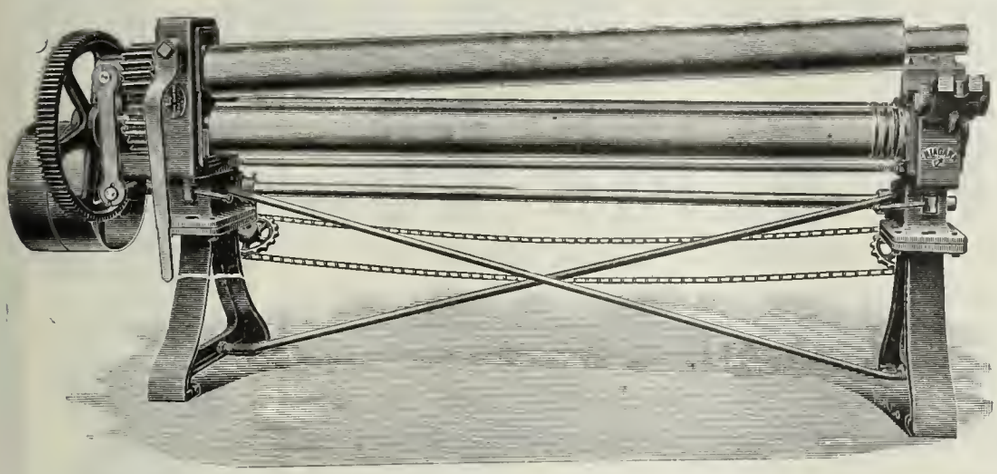
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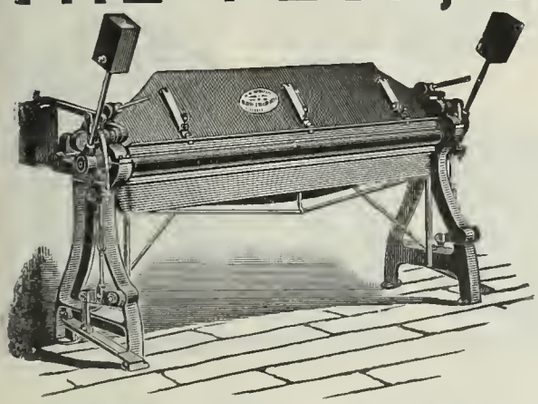
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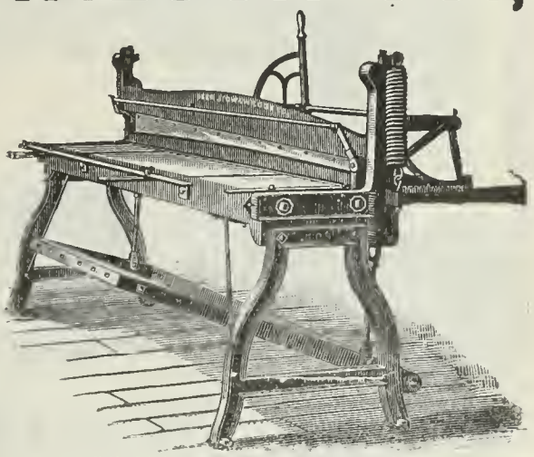
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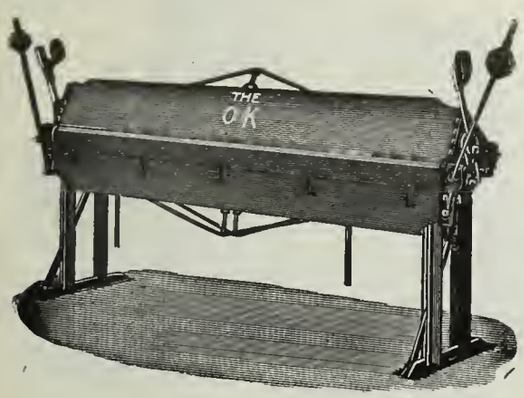
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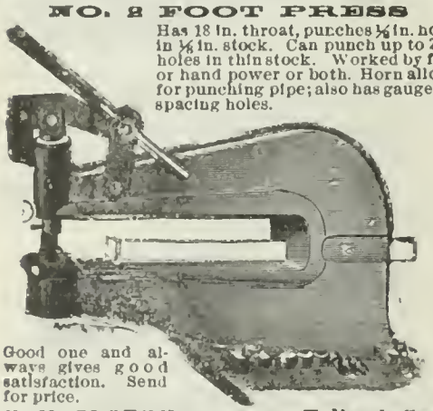
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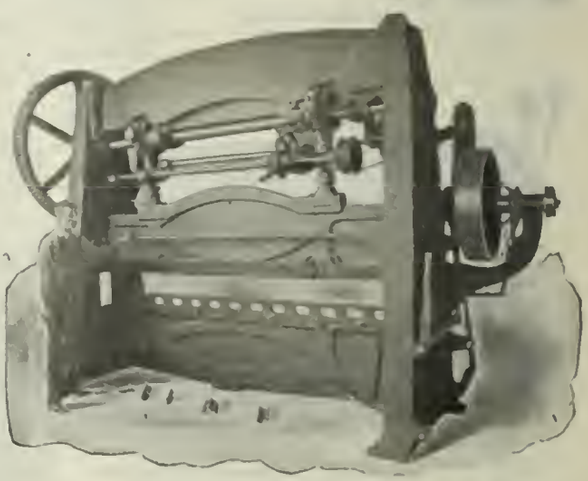
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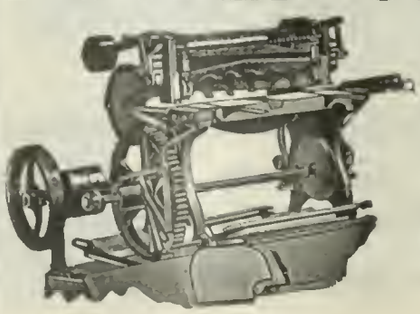
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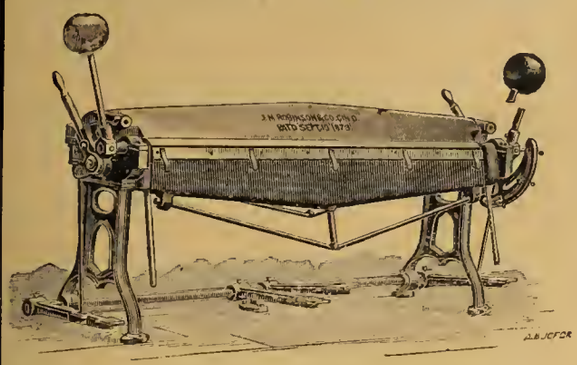
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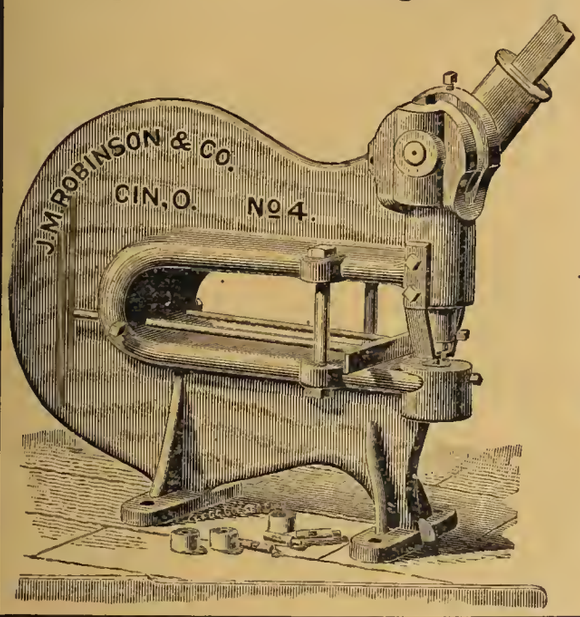
CAMBRIDGE CITY, IND., U. S. A.

Agents: MERCHANT & CO., Philadelphia, Pa.

Double Eccentric Cornice Brake.



Deep Throat Punching Press.



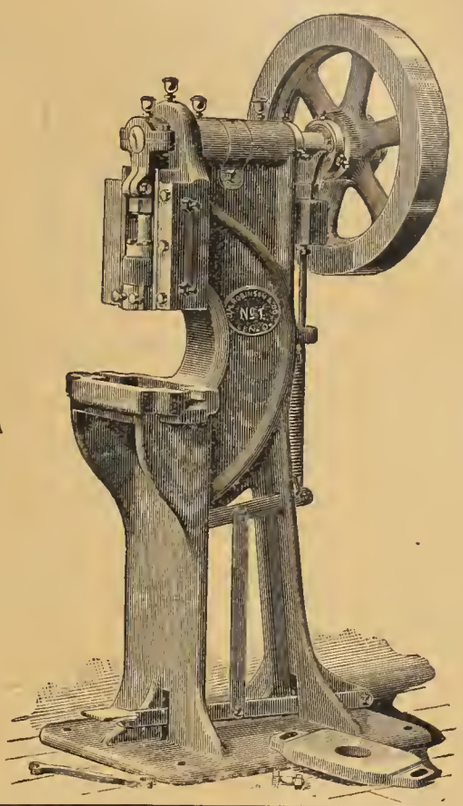
Punching Press

Sheet Metal Working Machinery

of all kinds manufactured by

THE J. M. ROBINSON MFG. CO.,

225–229 W. 2d St.,
Cincinnati,
Ohio.



KEENE FOOT POWER

CORNICE BRAKE.

Easiest to Operate, Strongest and Best.

SHEET METAL WORKING MACHINERY OF ALL KINDS.

FOOT POWER

CURVE MOULDING HAMMER.

The cheapest, most convenient and best sheet metal moulding former ever offered. Produces a greater variety of work than any other. Quickly adjusted and easily operated. Write for prices and discounts on this or any sheet metal working tool you may desire. We will name you bottom prices.



GEO.C. KEENE & CO.

CINCINNATI, O.

BEST HAND AND POWER MACHINERY

FOR RANGE & SHEET IRON WORK

PUNCHES SHEARS



PRESSES BRAKES

EXCELSIOR TOOL & MACHINE WORKS

212-214 SPRUCE ST. ST. LOUIS, MO

PHILADELPHIA MACHINE TOOL CO.,

445 North Darien St., Phila., Pa.

TESTING MACHINES and *SOLE AGENTS* for HENNING TESTING APPARATUS.

PRESSES and SHEARS, CORNICE PRESSES, CURVED MOULDING MACHINES, etc.

SHOVEL MACHINERY

We build complete equipments and control the latest patented machines for this work.

TIN CAN MACHINERY.

We make the very latest improved machinery for manufacturing cans and pieced tinware.

STEEL RANGE MACHINERY.

Recognized leaders for machinery and dies for oil and gas stoves, and gas and steel ranges.

For further particulars write

THE TOLEDO MACHINE & TOOL CO., Toledo, Ohio, U. S. A.

SELIG-SONNENTHAL & CO., Agts., London, England.

— TEACHER (of English): "Michael, when I have finished you may repeat what I have read in your own words. "See the cow. Isn't she a pretty cow? Can the cow run? Yes, the cow can run. Can she run as fast as the horse? No, she cannot run as fast as the horse."

Future Mayor (of Boston): "Git on to de cow. Ain't she a beaut? Kin de cow git a gait on her? Sure. Kin de cow hump it wid de horse? Nit—de cow ain't in it wid de horse."—*Judge.*

— SAID Mrs. G., who had come to spend the day, to little Edith: "Are you glad to see me again, Edith?"

"Yes, m'm, and mamma's glad, too," replied the child.

"Is she?"

"Yes, m'm. She said she hoped you'd come to-day and have it over with."—*Ohio State Journal.*

A Good Resolution



for the New Year will be to handle

New Model Grand Ranges.

They make many friends and earn good profits.

BARSTOW STOVE COMPANY,

BOSTON, 55 Portland St.
PROVIDENCE, R. I.
NEW YORK, Beekman and Water Sts.

FIVE BRANDS OF BRIGHT, CHARCOAL FINISH TIN PLATES.

"Brilliant,"
Tissue Paper Packed.

"Royal,"
Tissue Paper Packed.

"Merion,"
Tissue Paper Packed.

"Linden."

A FULL LINE OF COKE FINISHED PLATES.

N. & G. TAYLOR CO.,

Manufacturers,
PHILADELPHIA.

FOR OFFICE BUILDINGS

Frink's Cluster Reflectors for from three to eight lights will light offices more brilliantly, evenly and economically than any other fixture. Their extreme durability and power make them the cheapest to buy.

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L. & R. WISTER & CO.,

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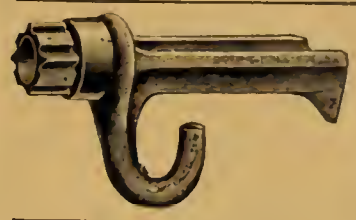
Dunbar Foundry Pig Iron.
Dunbar Connellsville Coke for Foundry Use.
American Sheet Iron Co.'s Sheet Iron.
American R. G., cleaned, of uniform black color.
Dealers in all kinds of Iron and Steel Scrap.

BRUCE & COO

TINNERS'
TOOLS and MACHINE

TINNERS' SUPPLIE

186, 188 & 190 Water Street,
248 & 250 Pearl Street,
NEW YORK.



Ideal Sap Spou

Are made open or closed, and a full line of other Maple Sugar goods. Send for dealers' price list.

CHARLES MILLAR & SON CO, Utica, N.

HUB RANGES.



HUB RANGES sell quickly because they contain so many exclusive selling features, so sensible and self evident.

HUB RANGES are used and endorsed by all the leading Cooking Schools in New England and New York.

SMITH & ANTHONY CO., - Boston.

Send for Catalogue of Hub Water and Steam Heaters.

It Takes Sand

for a merchant in any line of business tomainta in a fair, uniform price when some competetor with cheap inferior goods is shouting bargain prices ; but its no secret that honest, reliable goods always win in the end and that's why so many successful stove merchants sell

GLENWOODS.

Weir Stove Company, Taunton, Mass.

We Solicit Your Inquiries for

BRIGHT and TERNE PLATE

McCLURE & CO.,

Manufacturers of Tin Plate.

PITTSBURG, PA., 211, 213 and 215 Second Ave.
PHILADELPHIA, PA., 115 North 7th Street.

Index to Reading Matter, Page 48. Index to Advertisements, Pages 50 - 52.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

LVII. BER 3. | NEW YORK AND CHICAGO, JANUARY 18, 1902. | ONE DOLLAR A YEAR. SINGLE COPIES 5 CENTS.

WALWORTH MFG CO. TOOLS and SUPPLIES for STEAM WATER and GAS USERS BOSTON MASS

WALWORTH HEAVY PIPE VISE.



A first-class Tool for General Machine Work. Takes to 6-inch.

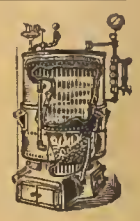
BOSTON, 128 Federal Street
NEW YORK, Park Row Building.



The Gorton Side Feed Boilers

FOR STEAM AND HOT WATER HEATING.
INVESTIGATE FOR YOURSELF.
Send for Catalogue and Prices.

GORTON & LIDGERWOOD CO.,
96 Liberty St., NEW YORK. Old Colony Bldg., CHICAGO.
77 Oliver St., BOSTON. Prudential Bldg., ATLANTA, GA.



STOVE LININGS

McLEOD & HENRY CO.,
TROY, N. Y.

Gray Iron Castings.

S. CHENEY & SON.
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"The Paragon Heater you put in for us has proved very satisfactory, heating our house nicely with very little fuel as compared with our old heater."

That is usually the sort of a letter received by the dealer who installs a Paragon Furnace, and it is usually accompanied by a check for the amount of the bill.

ISAAC A. SHEPPARD & CO.

NEW YORK **PHILADELPHIA** **BALTIMORE**

The best workman
ints the best tools and
aterials both—Apollo
lvanized iron — and
akes the most money
th 'em.

merican Sheet Steel Company
New York

If you have a line of

P. P. STEWART

Goods on your sample floor, your fall trade is assured.
Quick sellers bring big profits.

FULLER & WARREN CO., Troy, N. Y.

This Ad. changes every week.

NOTICE.

Silver, Nickel Platers and Brass Goods Mfrs. MATERIAL FOR DRYING PURPOSES.
Write for prices to John Sommer's Son, 355-365 Central Ave., Newark, N. J.



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GLOBE and ANGLE VALVES, IRON and BRASS.

All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.

Crosby Steam Gage & Valve Co.,
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328-330-332 Second Ave.,
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Galvanized and Black Sheets.

The past year broke the record Our sales in 1901 were largest ever known for "SCOTT'S EXTRA COATED,' the best American Roofing Tin. "FOLLANSBEE PURE IRON OLD STYLE ' is genuine Iron Base.

Philadelphia, 133 Arch St.
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LIEF and VATOR VALVES, AM TRAPS, AM AND WATER DUCING VALVES, NK TEMPERATURE A No. 1 DAMPER

NOISELESS BACK PRESSURE VALVES, PUMP GOVERNORS, STEAM and OIL SEPARATORS. CONTROLLER and REGULATORS

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17 W. 13th St., - NEW YORK.

JENKINS IMPROVED AUTOMATIC AIR VALVES.



Suitable for high or low pressure. Take no more room than an ordinary air cock. Endorsed by the leading steam experts as the best made and the quickest working. All genuine stamped with our Trade Mark.

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ROUND OAK STANDARD OF AMERICA

The Round Oak
Standard Range and
Cook
was produced
entirely
in our own shop.
We designed it,
made the patterns,
flasks—and every
detail connected
with it is our work.
Several prominent
merchants
throughout the country
have written us,
unsolicited, that it is
the best example
of cast range making
they have ever seen.
Merchants are not
going to take
the trouble to write
enthusiastically
about a cast range
now days unless the
workmanship
and working qualities
are markedly
superior to the
multitude.
Take a moment off,
ask us for details
about this range—
provided, of course,
you like to sell
good goods.



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P. D. BECKWITH

Dowagiac, Mich.

MAKERS OF GOOD GOODS ONLY

Experts Say That the Old Fashioned Testimonial Advertising is the most Effective.
You Can Get Testimonials A-Plenty if You Sell the CARTON "B."

CARTON "B"

WARM AIR FURNACE.



FOR SOFT COAL.

A Furnace With an Established Reputation For Thorough Efficiency.
Strong in Every Detail.
Made to Endure.

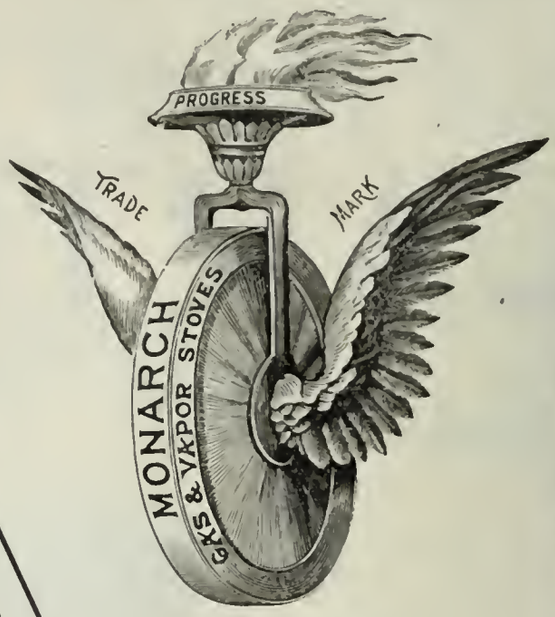
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UTICA, N. Y.

BOSTON. NEW YORK. CHICAGO. DENVER.

Largest Makers of Heaters in the World.

1802



NO!

We've not been making Vapor Stoves, Oil Stoves and Ovens 100 years; but, and it's a big but, long enough to realize that unless we had the best to offer the trade we'd simply be out of the running, so that

The Monarch Line

will always be found in the very best stores throughout the country. They are always up to date; in fact, a little ahead.

Get a copy of our New Catalogue, it's the finest yet, or write to any of the addresses given below.

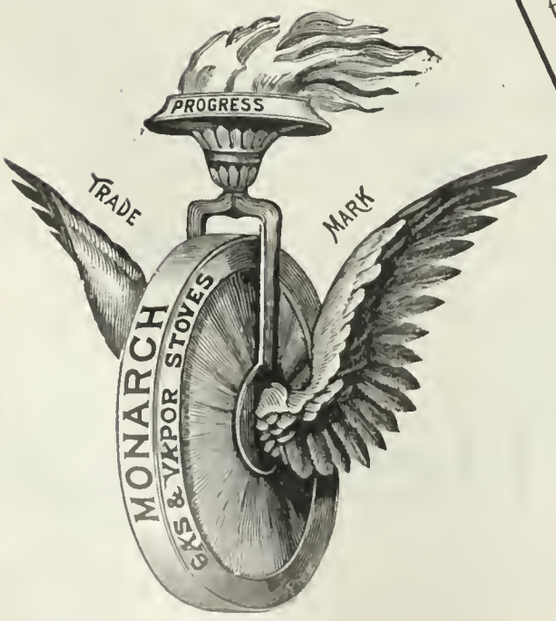
THE MONARCH STOVE & MFG. CO.,

MANSFIELD, O.

BRANCHES.

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107 N. 2d St., Phila. 191 Eagle St., St. Paul, Minn.
203 Wood St., Pittsburg.

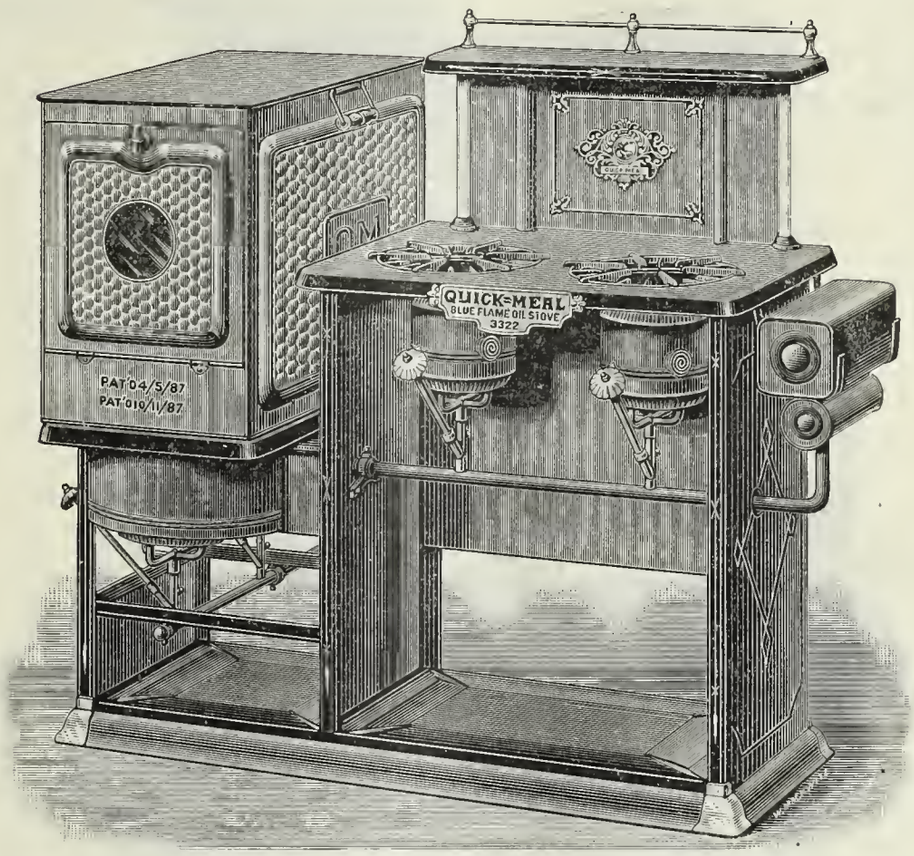
H. R. BRUCE & CO., Agents,
419 Pike Bldg., Cincinnati, O.



1902

QUICK MEAL

Wickless Blue Flame Oil Stoves.



A NEW and strong feature of the **"QUICK MEAL"** Wickless Blue Flame Oil Stove is its improved burners, which add to its simplicity, durability and make them easy to regulate and keep in clean condition.

They are well made and **Attractive** in **Design** and **Finish.** Only one valve to operate, which makes them easy to sell and easy for the user to understand.

P. S.—**"QUICK MEAL"** Steel Ranges have more good practical selling points than any other Steel Range.

THE QUICK MEAL STEEL RANGE

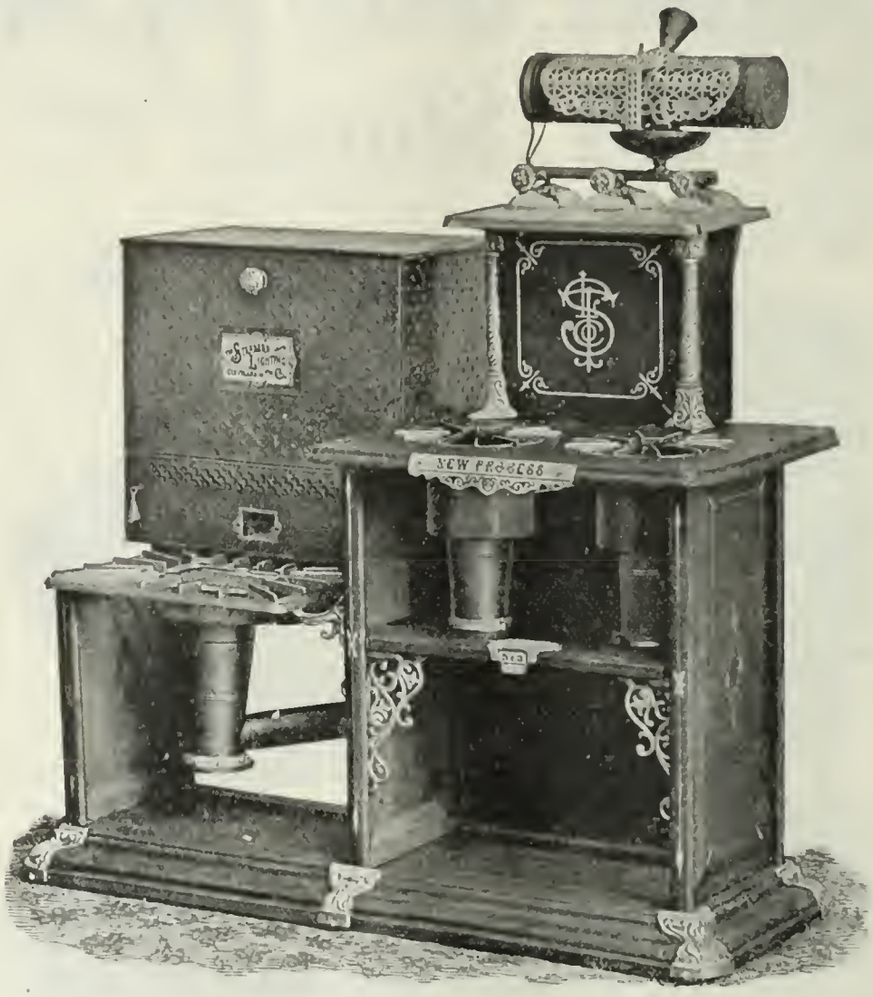
RINGEN STOVE Co. SAINT LOUIS

Old as the Oldest, New as the Newest.

If You Are Not, You Ought to be Selling

The "NEW PROCESS" VAPOR STOVE

The Most Popular and Successful Gasoline Stove Ever Made.



You have made a friend and some money, when you have sold a "New Process." Don't grope in the dark for "maybes," when, in the bright light of experience, you can buy a "sure thing" success.

No better recommendation can be given the "New Process" than that the following successful Jobbers after years of experience still sell it. Write them now for the agency.

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THE S. M. HOWES CO., Boston, Mass.

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W. B. BELKNAP & CO., Louisville, Ky.

THE NORTHWEST.

FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.

PACIFIC COAST STATES.

HOLBROOK, MERRILL & STETSON, San Francisco, Cal.

DOMINION OF CANADA.

THE THOS. DAVIDSON MFG. CO., . . Montreal, Quebec.

WESTERN JOBBERS.

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MORLEY BROS. . Saginaw, Mich.

TOWNLEY STOVE CO., Terre Haute, Ind.

F. TIEMANN STOVE & HDWE. CO., St. Louis, Mo.

TOWNLEY METAL CO., Kansas City, Mo.

A. C. RAYMER, Omaha, Neb.

M. P. BORDEN STOVE CO., Denver, Col.

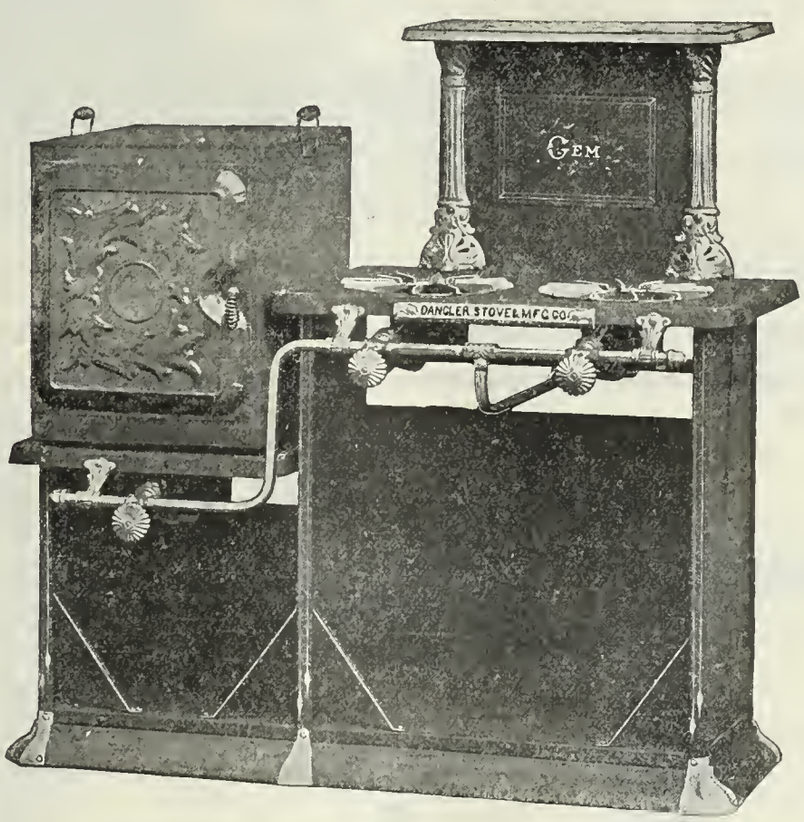
THE STANDARD LIGHTING CO., Cleveland, Ohio.

THE DANGLER

For 1902 will put on the market a line of

Gasoline Vapor and Evaporating Stoves, Blue Flame Wick and Wickless Oil Stoves and also a line of Gas Ranges, Stoves, Hot Plates, etc. . . . . .

That for design, style and mechanical construction will not be equalled by any other make.



Our experience of 21 years in the manufacture of this line of goods,—being the oldest manufacturers,—justifies us in making the claim that our product has merits not found in other makes of Stoves in this line, notwithstanding that our lists, discounts and terms are the same as other manufacturers'.

All orders intrusted to us will have our careful and prompt attention. For further information we invite correspondence.

The Dangler Stove & Mfg. Co.,
Cleveland, Ohio, U. S. A.

1902

THE TWIN BURNER

Line for the New Year is far and away ahead of anything yet shown in

Gasoline and Oil Stoves.

GET OUR CATALOGUE. SENT FREE.

TWIN BURNER VAPOR STOVE CO.

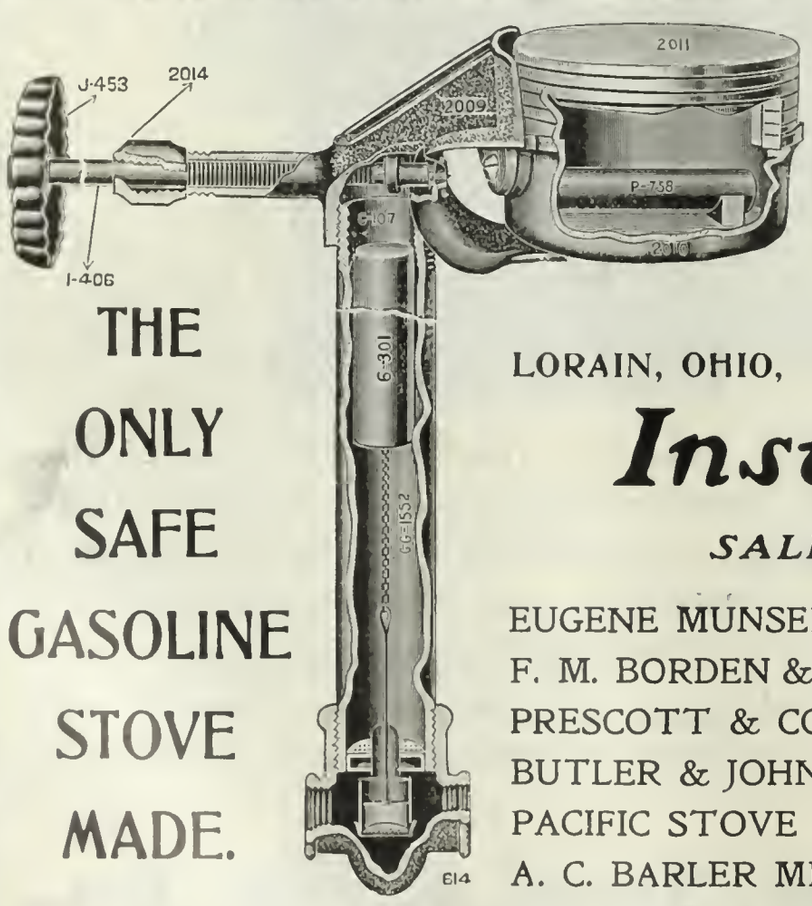
206-210 South Seventeenth St.,

ST. LOUIS, MO.



No. 480.

Our New No. 480 can be used for Gasoline or Coal Oil.



THE ONLY SAFE GASOLINE STOVE MADE.

NATIONAL STOVES

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Insurance

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F. M. BORDEN & BRO., - - Philadelphia
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BUTLER & JOHNSON, - Syracuse, N Y.
PACIFIC STOVE CO., - - Los Angeles, Cal.
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HARPER & McINTIRE CO. For IOWA, NEBRASKA. KANSAS, MISSOURI.



OUR

CATALOGUE,

SHOWING

GAS RANGES
CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS

WILL BE FURNISHED FOR THE ASKING BY

Enterprise Stove Co., VINCENNES, IND.

JEWEL STOVES AND RANGES..

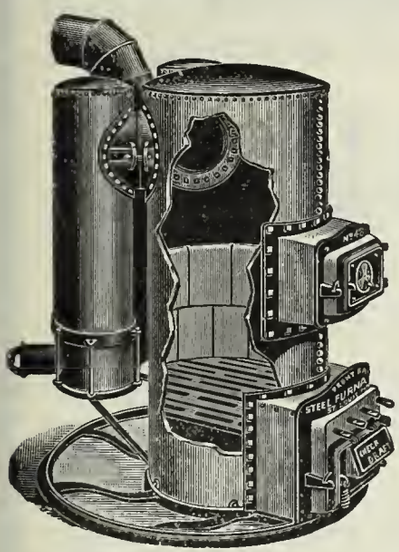


A Complete, Well Advertised Line; Low Prices and Good Workmanship.

Please Write for Catalogue.

DETROIT STOVE WORKS.

Detroit - Chicago.



A FEW POINTS OF SUPERIORITY

Fire pots are of fire clay tiling and never burn out.
Radiator surface in proportion to grate surface unusually large.
Only absolutely gas tight furnace made.
Novelty of construction makes an easy seller.
Tested for fifteen years.

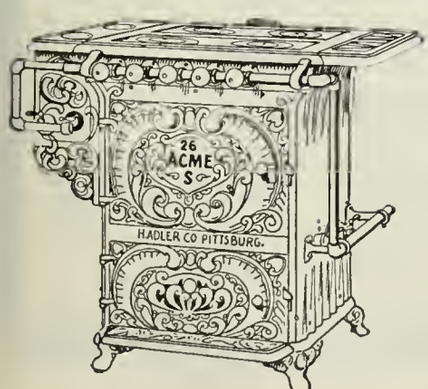
Repairs are seldom necessary.
Are guaranteed to burn hard or soft coal.
No direct draft to warp out of shape, nor packed joints to leak gas.
Katalogue and prices will be mailed you upon application.

FRONT RANK STEEL FURNACE CO., 2301 to 2309 Lucas Ave., St. Louis, Mo.

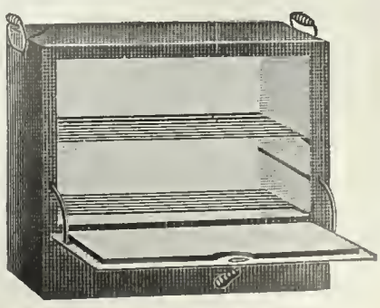
ACME LINE, 1902.

Asbestos Lined Ranges and Ovens, Cookers and Hot Plates.

FOR ALL GASES.



Catalog No. 35 on application.



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PITTSBURG, PA.

HENRY WATERMAN, - - 195 Lewis St., N. Y., Eastern Agent.

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WESTFIELD, MASS., U.S.A.

Catalogue furnished only upon application to

Heating Contractors, Engineers and Architects

64 Pages. Size 9 x 12 Inches.

INDIRECT RADIATORS

(16 STYLES)

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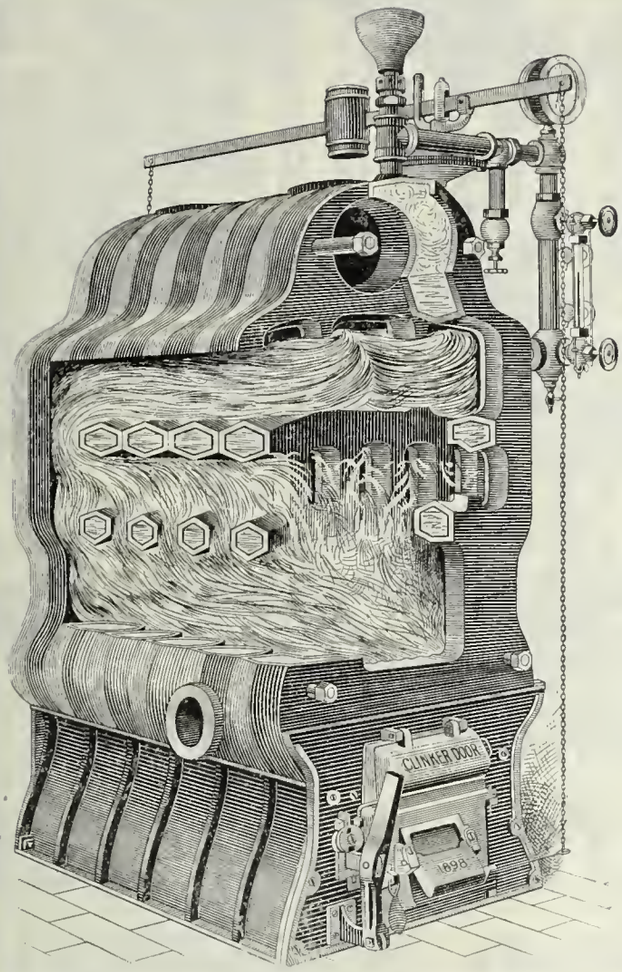
BREMEN AND NEW YORK CITY.

SALESROOMS:

THE H.B.SMITH CO.,

133 CENTRE STREET,
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510 ARCH STREET,
PHILADELPHIA.



IDEAL SECTIONAL STEAM BOILER.

Ideal Boilers

will be more popular than ever in 1902, and we shall be prepared to give even better service than during the past busy year.

Have you our Catalog?

AMERICAN RADIATOR COMPANY

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New York, Philadelphia, Buffalo,
St. Louis, Minneapolis, Denver.

WROUGHT STEEL

RANGES

LIKE THE

"PACIFIC"

Are best because they're made stronger, better, more perfect than any other similar construction. You should write for prices and secure our Catalogue.

It is made with High Closet, Rolling Front, Six Holes, for Hard or Soft Coal; is the latest, best and handsomest Steel Range ever offered, one that you can offer as simply "out of sight" compared with that sold by the peddlers. Try it.

...THE...

JOHN VAN RANGE CO.,

Warerooms:—419 ELM ST.,

Factories:—6-8-10 and 12 HOME ST.,

CINCINNATI. O.



Royal Heaters.

MANUFACTURED BY THE

HART & CROUSE Co.

UTICA, N.Y.

ALL THE LEADING LINES OF

STEAM, HOT WATER & HOT AIR,

FOR HEATING ALL CLASSES OF BUILDING.

235 WATER ST., N.Y.
COLUMBUS, O.

BRANCHES.

79 LAKE ST., CHICAGO,
ST. LOUIS.

All Cast Iron Double Radiator.



Quality First

IS THE PRINCIPLE FOLLOWED

In the Manufacture of

MUELLER

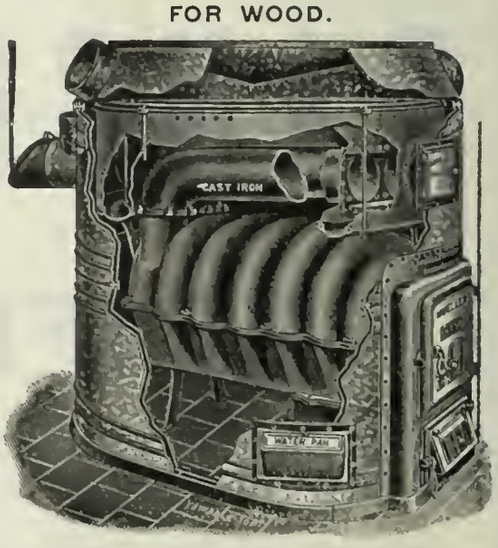
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Made in all Styles—For all Kinds of Fuel.

GET OUR SPECIAL REGISTER OFFER.

EVERYTHING IN THE HEATING LINE.

FOR WOOD.



190 Reed St., L. J. MUELLER FURNACE CO., Milwaukee, Wis.

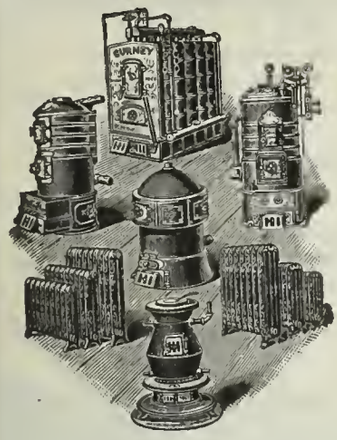


WINCHESTER

The "WINCHESTER" Heater is no ordinary casting. It is, as a heater, imposing in excellence, and pre-eminent in construction. Have you ever seen one in operation? We can hardly imagine a fitter who has, failing to ask the particulars as to an agency. Manufactured by Smith & Thayer Company, Boston, Mass.



HEATER.



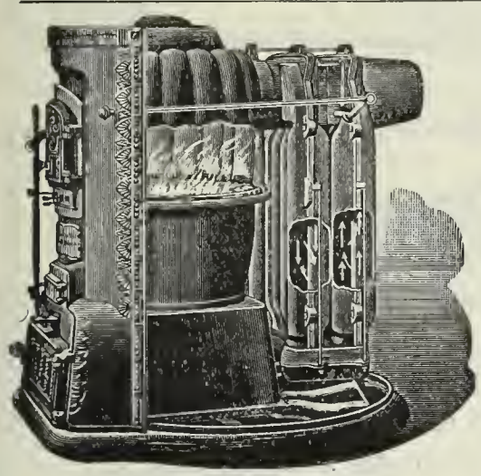
Gurney Heaters

Provide every advantage a heater can provide,—the very best material, the most durable and approved construction, insuring the greatest efficiency from the least possible consumption of fuel.

CAPACITIES FULLY GUARANTEED.

Don't you wish to handle the BEST? Send for our latest trade catalogue.

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Western Selling Agents, JAMES B. CLOW & SONS, 222-224 Lake St., Chicago, Ills.



Bengal Furnaces.

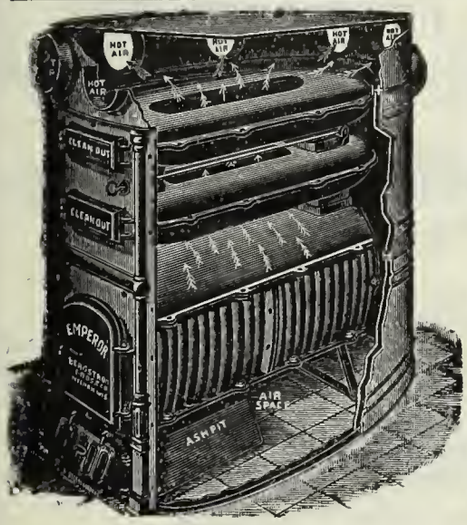
Without a Competitor.

THEY SHOULD LEAD YOUR LINE AS THEY DO OTHERS.

SECURE A BENGAL AGENCY AT ONCE.
CATALOGUE ON APPLICATION.

EASTERN SELLING AGENTS:
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Emperor Furnaces

FOR WOOD.

Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces. . . .
Furnished for either Brick or Galvanized Iron Casing.

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STOVES, RANGES and FURNACES.

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HOT WATER GENERATORS
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GURNEY AND COMPANY
WASHINGTON, HANOVER AND ELM STREETS
BOSTON, - MASSACHUSETTS

COMPARISON *is* TEST.

WE want you to test a "DIGHTON" now—set it to heat the north end apartment of a block of houses and compare fuel consumption with whatever Furnaces may be used in the others.

If the owner or architect has specified some other name because of extensive advertising or for any other equally "valuable" reason, tell him to give you an opportunity to prove the "DIGHTON" the most economical and satisfactory Furnace ever built.

We can tell you of a dealer that sets a good many different makes. He now sets 12 "DIGHTONS" to one of any other make, having proved to his own and several customers' satisfaction that the "DIGHTON" is the best.

Another dealer took out a 24 inch pot—that had been used three years (had never given satisfaction); a 24 inch pot "DIGHTON" set in place of it heats every room perfectly, with less fuel, and no change of any kind was made in the piping or cold air duct.

If you've got or can make an opportunity to test a "DIGHTON" where conditions allow of comparison, *do it*, and do it *now*. We'll sell you more "DIGHTONS" in 1902 than you sold of all other kinds together in 1901.

DIGHTON FURNACE CO., Taunton, Mass.

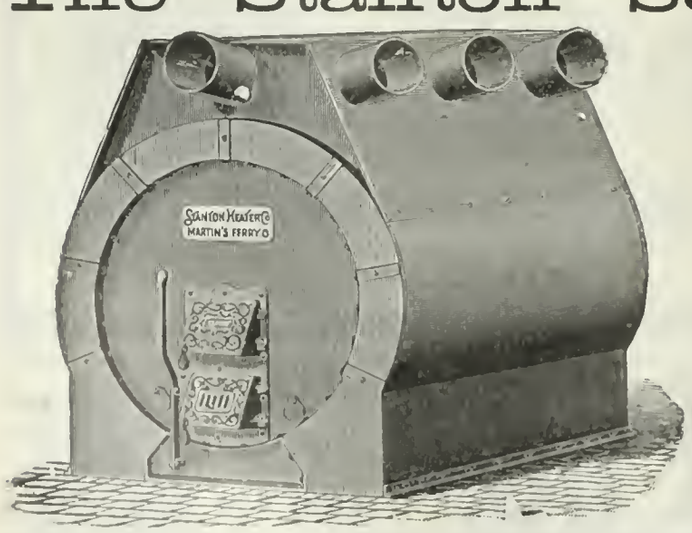
Your Guarantee is Good,

If backed up by our line. We make many kinds and sizes of steam and hot water boilers, and you as a dealer ought to know all about this line. Let us send you our printed matter and post you on the standard line. Write to-day.

KEWANEE BOILER COMPANY

KEWANEE, ILLS.

The Stanton Seamless Heater,



PORTABLE CASED.

WEST LIBERTY, IA., June 22 1900.

THE STANTON HEATER CO.,
Martin's Ferry, Ohio.

Gentlemen:—I had a Stanton Seamless Heater put in my house last year and it gives perfect satisfaction. Have no trouble in keeping the whole house comfortable in the coldest weather.

Anyone wishing a Furnace will not make a mistake in buying a Stanton Seamless Heater.

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THE STANTON HEATER CO.,
Martin's Ferry, Ohio.
See Our Advertisement Next Week.

GILT EDGE FURNACES AND COMBINATION HEATERS.

Registers, and Tin and Galvanized Iron Furnace Fittings.

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They regulate heat in residences, offices, stores, mfg. plants. Guaranteed.

The Howard Thermostat Co.

West Water Street, Oswego, N. Y.

No electricity or compressed air Simple as a heavy spring motor can be.

Would like to send you their catalogue and give a few reasons why you should sell their Heat, Valve, Draft and Damper Regulators. This should be an interesting topic. We have the most simple thermostat made; also the most sensitive. Only three parts—a sensitive and powerful sensitive plate, a heavy spring motor made of brass and common pulley connections Just enough material to do the work satisfactorily, but not one atom too much. They do "straight work," without the aid of outside agencies. No other thermostat on the market can do more with all of its electricity and compressed air connections.

THEY SAVE THE COAL

WHICH IS WASTED BY THE WRONG OPERATION OF FURNACE OR BOILER DAMPERS.



TEN BELOW ZERO DOES NOT BOTHER THE

RICHMOND HEATER.

IT IS EFFECTIVE IN ALL KINDS OF WEATHER. POWERFUL, ECONOMICAL, EASY TO REGULATE, DURABLE.

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Double Flue Ranges.



Only Double Flue Ranges in the Market. The Greatest Fuel Saver. Draw-Out Grate.

Handsomely Finished Throughout. Prices Within Reach of all.

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THE BEST GAS STOVE MADE.

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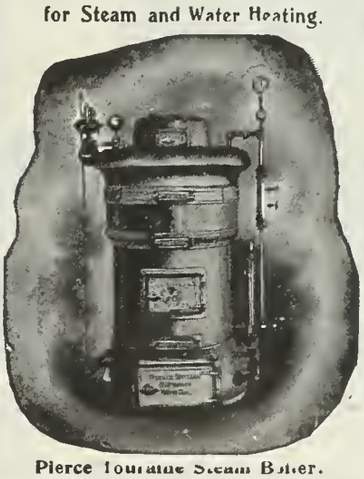
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BOILERS and RADIATORS

for Steam and Water Heating.



Pierce Touraine Steam Boiler.

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ECONOMIC IN FUEL CONSUMPTION.

Endorsed by the foremost Architects and Heating Engineers.

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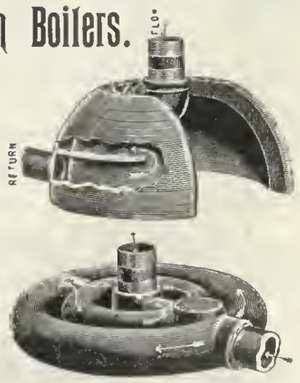
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The Champion Hot Water Combination Boilers.

They Fit Any Furnace.



Base section when used without ring sections.

Ring Section.

These Boilers are made in three sizes diameter, and from 100 to 600 square feet radiation capacity.

Will heat those cold rooms, or an addition to the building. Will increase the capacity of any furnace. Are cheaper than coils and will do more work.

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HOT WATER AND HOT AIR



HEATING BY COMBINATION STOVES AND FURNACES.

Suitable for Large or Small Houses, Stores, Conservatories, Barber Shops, Hotels, etc., etc.

Heat Water Quickly.
Circulation is Positive.
No Joints Inside to Leak.

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LAUNDRY STOVES CONFECTIONERS' STOVES
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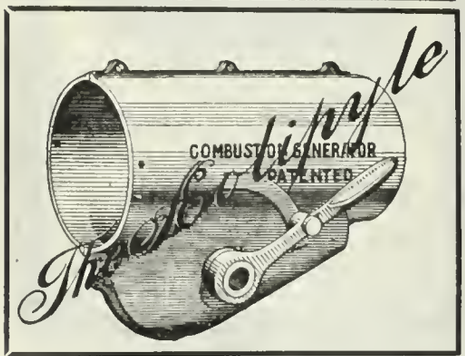
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The most economical Steam and Hot Water Boiler on the market. Write for Catalogue and Price List.

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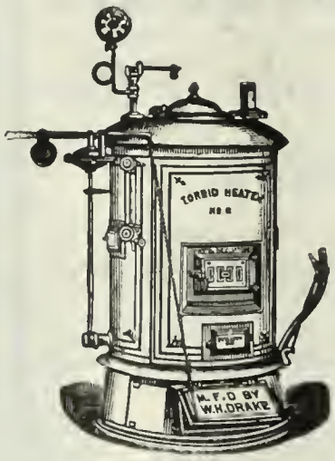
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Keeps Temperature Even,
Prevents Escape of Coal Gas,
Reduces Labor,
Avoids Sifting Ashes,

When Applied for Domestic Use to Smoke Pipe of

House Furnace,
Hot Water Heater,
Low Pressure Boiler,
Stove or Range.

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"TORRID HEATER."
FOR STEAM OR HOT WATER.



It is Practical in Design.
It is Safe, Being Tested to 200 Pounds.
It is Easy to Manage and Keep Clean.
It is Durable.
It is Sectional and Easily Handled.
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It has the Torrid Patent Rocking and Dumping Grate.
It is Low in Price.

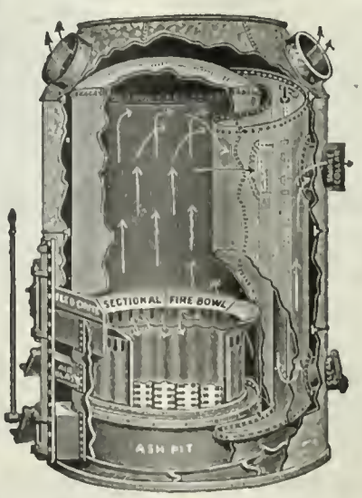
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THEY ARE THE BEST.

The Torrid Zone Furnace



is a trade winner because it has points of merit peculiar to itself that can be found in no other steel furnace. Our new catalogue is now ready to mail and a description of our Hot Air and Hot Water Combination Furnace can be seen in it. We furnish either the cast iron lining or the fire brick at the same price. Our Wood Furnace is called a powerful heater by those who use it.

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AHEAD AS USUAL.

We have not only stood the test of time, but look at the result of physical test of Quimby Engineering Company before Building Committee, on competition for public work in an Eastern city.

QUIMBY ENGINEERING COMPANY.

PHILADELPHIA, PA., Aug. 5, 1901.

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QUIMBY ENGINEERING CO.,
H. H Quimby, Proprietor.

Attest: JOHN M. LUKENS,
Chief of Bureau of Steam Engine and Boiler Inspection, City of Philadelphia.

It Clearly Puts Our "Cornell" IN A CLASS BY ITSELF.

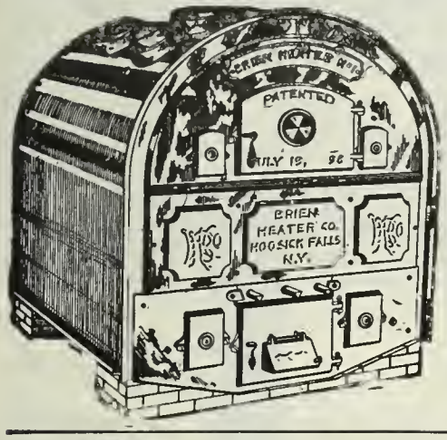
Think of it—250 pounds pressure on a Cast Iron Boiler. This is the only kind of Boiler that is good enough for you. We make all our Boilers of the different styles the same way—the right way.

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"Everything for Heating."

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A perfect, all cast WOOD or COAL burner. There is no other Hot Air Furnace as low down as the "BRIEN."

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OUR LATEST PRODUCTION.

BAKES EVENLY BY THE CIRCULATION OF HOT AIR.

FOR BAKERS, CONFECTIONERS, HOTELS,

Also the best oven for Core Baking, Japanning, Enamelling, etc.

Made in six sizes, single and double, for coal, wood, natural or artificial gas.

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There is nothing equal to it for repairing fire brick in stoves, furnaces, etc. Let us send you sample and prices.

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Write us. Probably we can save you some money.

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SELECTED MICA ONLY.

Prepared expressly for the Stove and Hardware Trade.

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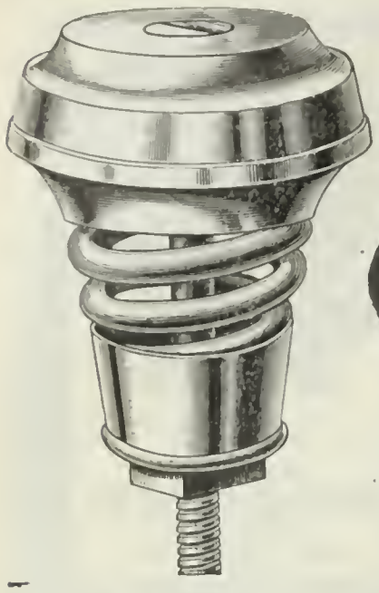
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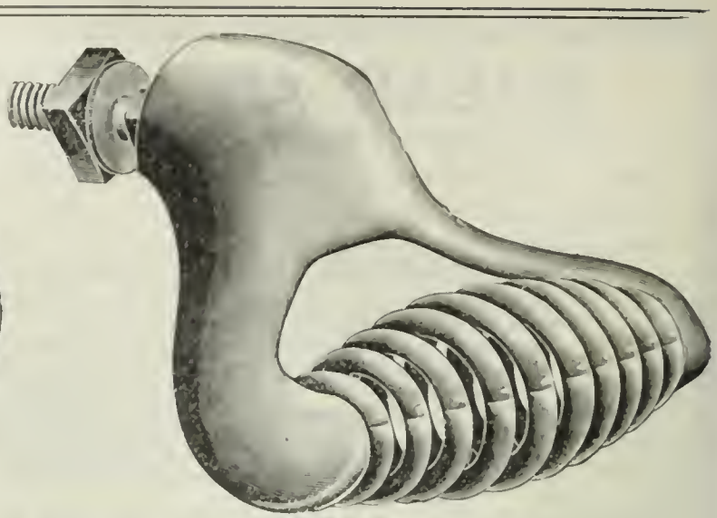
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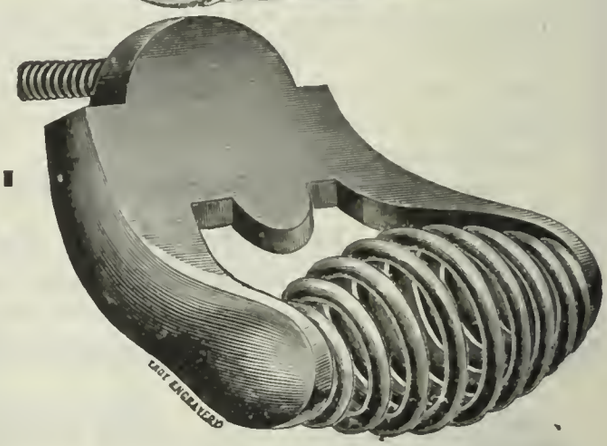
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If you want your stoves up-to-date you must use Alaska Stove Trimmings.

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"O.H." ONE PIECE STOVE PIPE Elbows

Perfectly round and true to size. With long ends, DOUBLE LOCK SEAM in throat or under side of Elbow.

HANDSOMEST, HEAVIEST AND STRONGEST STOVE PIPE ELBOW MANUFACTURED.

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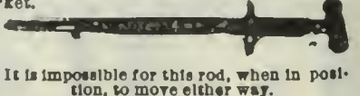


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THE YANKEE EXCELS.

Above All—Cheapness—a dealer cannot possibly make dampers as cheaply as we sell the Yankee. Easily put in and taken out of pipes. Stiffest, quickest-working and neatest damper on the market.

ROD POINTS: Has wood enameled handle. Wood handle cannot come off. Washer and spring cannot fall off the rod. Same size of holes are punched on each side of pipe. Rod is made of ¼ inch cold-rolled steel and slips into damper very smoothly. **Sample sent to any Dealer without charge.**



It is impossible for this rod, when in position, to move either way.

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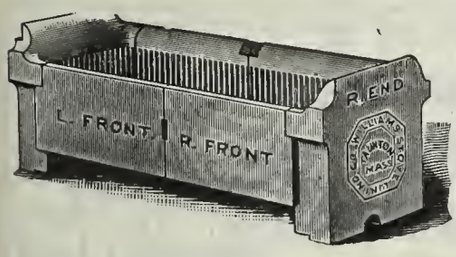
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This is the only book that has been brought out which presents a systematic and reliable treatment of the warm air furnace system of heating.

It deals with the various types of furnaces, their construction, proper location and setting, together with furnace fittings, and all matters pertaining to the installation of furnaces and to effective and economical heating by warm air. The subject is discussed for the first time by a competent author possessed of a scientific education and a practical training, who presents positive rules, based on a long experience, for guidance in designing furnace systems for dwellings and other buildings where this popular method is employed. The various details of furnace work are described simply and at such length that the volume will be valuable to all who are in any way interested in the subject. It is recommended to practical furnacemen, to architects, builders and house owners, and to tinners and plumbers in suburban sections who do furnace work. To all these it will prove a reliable text-book and guide.

PARTIAL SUMMARY OF CONTENTS BY CHAPTERS.

Chapter I.—Furnaces—Is devoted to Furnace Construction—The Relative Proportion of Furnace Parts—Secondary Heating Surface—Economy and Efficiency—Heating Capacity and Exposed Wall Surface—Manufacturers' Ratings of Their Own Productions, etc.

Chapter II.—House Heating—Compares Furnaces and other apparatus, and describes Method of Setting Brick and Portable Furnaces—Location and Area of Cold Air Supply—Cold Air Rooms and Air Filters—Return Ducts and Air Circulation—Size of Hot Air Pipes—Location of Registers, etc.

Chapter III.—The Combination System—Discusses Heating Distant Rooms with Radiators—Balancing the System—Location of Water Heater in Furnace—Capacity of Water Heaters—Size of Radiators, etc.

Chapter IV.—Air—Deals with the Necessity of Ventilation—Water Needed to Moisten Air—Expansion of Air—Velocity of Air in Tubes, etc.

Chapter V.—Heating and Ventilation of Buildings—Considers the Size of Furnaces Required—Fresh Air Room and Supply—Air Circulation—Size of Flues—Use of Stack Heaters—Size of Heating Coils in Vent Flues, etc.

Chapter VI.—Heating of Public Buildings. Churches and Stores—Is given to the Size of Furnaces Required—Grate Surface in Ventilated Buildings—Air Supply—Size of Heating and Ventilating Flues—Size of Stack Heater, etc.

Chapter VII.—Pan-Furnace Combination System—Is devoted to Positive Warm Currents from Fan Systems—Location of Fan and Driving Apparatus—How Good Furnaces are Aided by Fans—Types and Efficiency of Fans—Area of Ducts and Flues, etc.

Chapter VIII.—Temperature Control.

Chapter IX.—Estimate and Contract Blanks.

Chapter X.—Value of Fuels. The Proper Size for Furnace Chimneys—with tables.

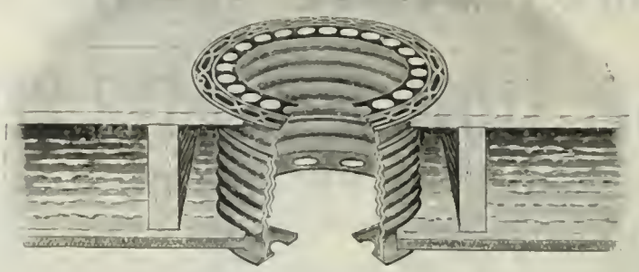
APPENDIX.

Furnace Fittings.—A section of 45 pages dealing with the Making of Furnace Casings—Metal Cold Air Boxes—Making Furnace Bonnets and Collars—Making Pipe and Elbows—Register Boxes and Stack Shoes, etc.

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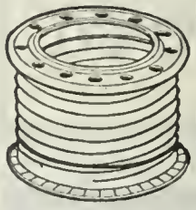
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Made in two parts which screw together and adjust to any thickness of floor or partition. They hold the plaster firmly and are not loosened by any agitation of smoke pipe. Have no springs to get out of order or no loose parts. Made of bright tin with ends handsomely japanned.



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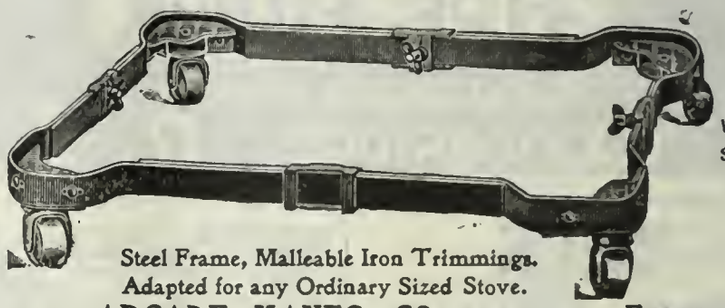
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The Standard Adjustable Stove Truck.

FINISHED IN BLACK ENAMEL.

Fully Warranted.



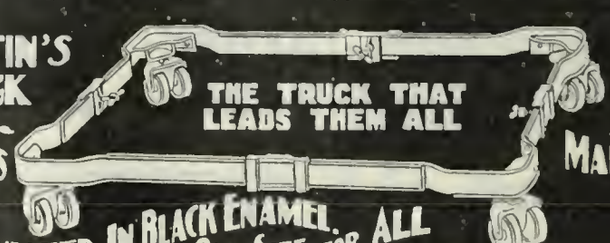
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Steel Frame, Malleable Iron Trimmings.
Adapted for any Ordinary Sized Stove.

Manufactured by ARCADE MANFG. CO., - Freeport, Ill.

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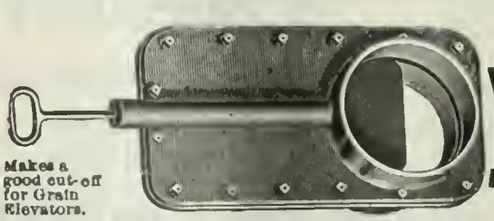


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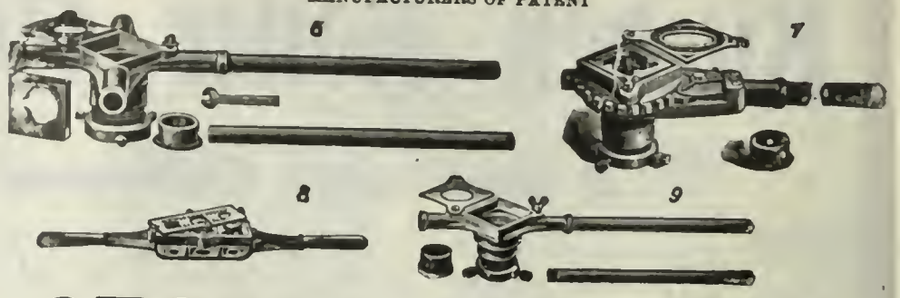
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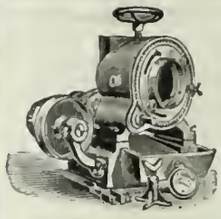


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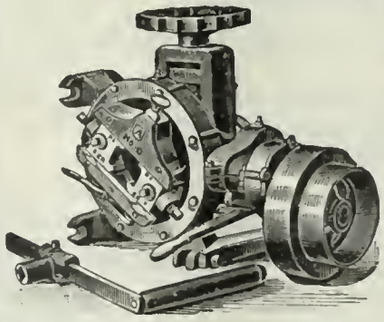
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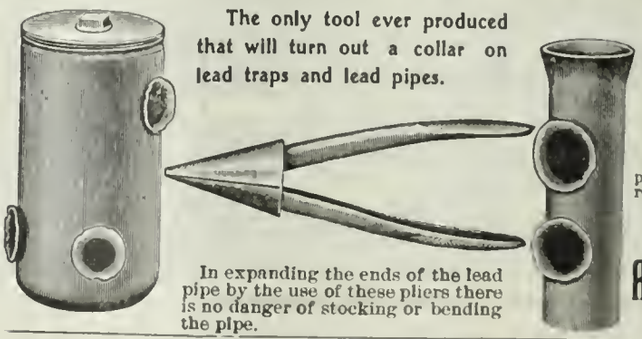
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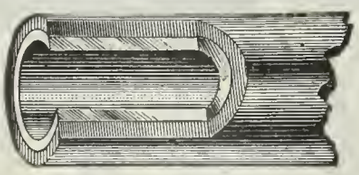
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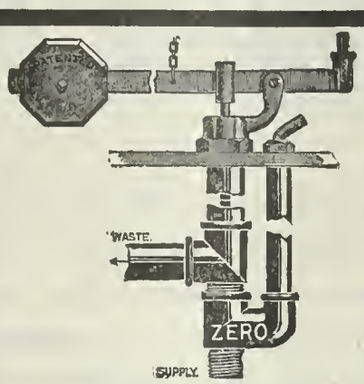
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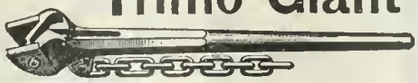


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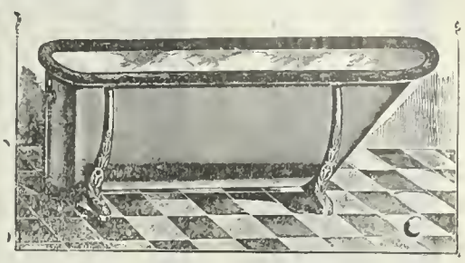
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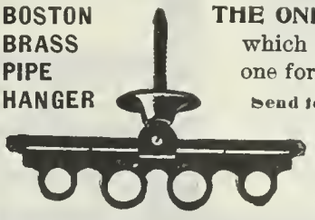


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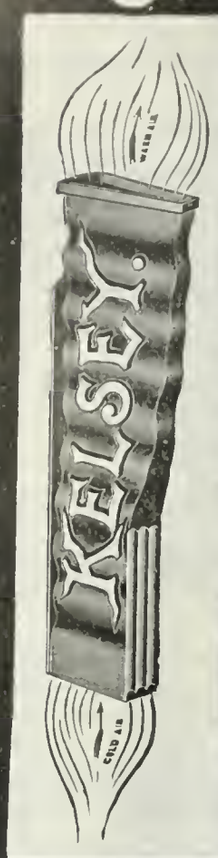
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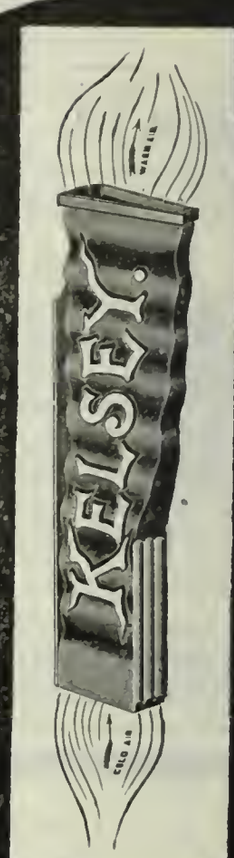
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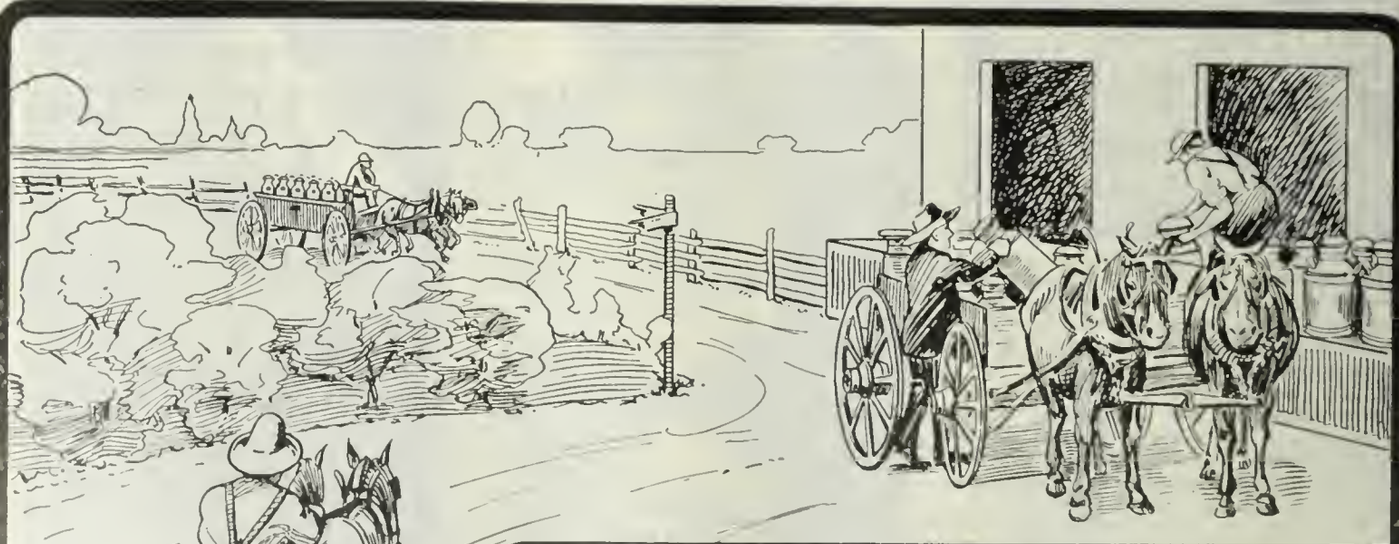
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NEW YORK AND CHICAGO.

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Decline in Pig Iron Production

According to the monthly blast furnace statistics of *The Iron Age*, the furnace capacity of the country in active operation on January 1 reflected to some extent the troubles which beset the managers during the last two months of the past year. The furnaces entered the new year with a capacity of 298,460 tons per week, as against 324,761 tons on December 1, 1901, while stocks of pig iron showed a decrease of only about 6500 tons for the month. This small decrease is due to the fact that while many furnaces reduced the amount on hand, others accumulated iron, because they could not ship it as fast as wanted owing to the lack of transportation facilities. Quite a number of stacks were blown out in December and others were banked again and again. The disturbance created by the inability of the railroads to handle the business offered to them lessened the output of pig iron last month considerably, and was the only reason for decline in the output of the furnaces. Had it not been for this obstacle there is every reason to suppose that the productive capacity of pig iron on January 1 would have shown an increase over that of December 1, as the consumptive demand has been and still is very heavy. The Pittsburgh and the Chicago districts were the principal sufferers from the coke shortage. This condition, however, begins to show signs of betterment, and it is likely that the January product, should the improvement continue, will be larger than the status of the furnaces at the beginning of the month would indicate. The pig iron market continues strong and the consumptive demand is very active, especially in foundry irons, which have stiffened in price from 25 to 50 cents per ton during the week. The outlook in this branch of trade gives every indication of continued activity and strong prices, at least for the first half of the year.

Minute Economies.

It has been for years the aim of manufacturers to avail themselves of the benefit of the most minute economies in the production of their goods. This has been forced upon them by the stress of competition, as in the long run success belongs to those who can turn out a given product at a minimum price. The application of this principle of economy in production is to a great extent the secret of the invention and enterprise which are so characteristic of this country, and which have so much to do with its manufacturing supremacy. The representative American manufacturer is constantly endeavoring to effect a saving somewhere. Not only machinery and inventions which effect important economies are sought for, but there is an unceasing effort to avoid unnecessary expense in any department of the business.

The same principle is applicable to mercantile business, in which the expense account is constantly to be reckoned with. Its tendency to grow and absorb the profits is one of the features of business. Enterprise, which is essential to success, usually involves outlay, which must notwithstanding be kept strictly within bounds. In connection with the repression of unprofitable expenditure there must be a close scrutiny of all the details of the business with a view to eliminating any outlay which does not justify itself, and also to diminish the expense in every department, so that the business may be carried on at as low a cost as possible. There is little doubt that this is a lesson which merchants need to learn. In this respect the manufacturers are far in advance of them. The scrutiny of cost is much more rigid in the making than in the selling of goods. This is true in a good degree of many of the large houses, but the remark is still more applicable to the smaller houses. One of the good results of the associations which have been taking so prominent a place in the hardware trade is the success with which they direct the attention of the members to the necessity there is for good business methods in this and many other matters. The tendency should be toward saving wherever it can be effected.

Profits in Manufacturing.

It would naturally occur to one at first blush that the greatest profit in the manufacture of hardware would be in lines that are complex in their nature and that require special talent and equipment for their production; yet, outside of patented articles, such does not seem to be the case. The principal difficulty appears to be that in lines of this nature the demand is comparatively limited, and that consequently the question of tonnage as affecting cheapness of manufacture cannot be considered. On the other hand, the proportion of profit is limited by the fact that the price of such articles largely determines their use, as too high a price interferes seriously with the demand. Against this is the further limitation that such goods are necessarily costly to produce, because of special facilities, expensive machinery and high-priced labor, so that the percentage of profit is not great, considering the limited output, uncertainty of demand and the further limitation as to selling prices.

The manufacture of very staple goods is often regarded as less than promising, yet as a rule they have represented the largest volume of profit. It is true that almost any one can make them, that the margin of profit is small, that competition is severe, and that the goods are sold largely on their price, there rarely being anything specially distinctive in any one make. Yet it is equally true, and herein seems to lie the advantage, that the goods are made economically with cheap labor as a rule, and largely by machinery, that they can be moved in large quantities, and that there is always a demand for them. Success in such goods seems to be partly a

matter of location and largely a matter of executive ability. It is certain that the great fortunes in the manufacture of hardware have been made principally along these lines.

On the other hand, it is undoubtedly true that the manufacturer of special goods of minor importance has often been rewarded with success in building up a profitable business, which, while not always giving a great fortune, has yielded a reasonable competence. Many illustrations of this will occur to the trade where articles outside of the great staples have made for themselves a position in the market, while their manufacture has been attended with substantial profits. Such lines are frequently protected by patents and thus the manufacturer secured in his control of the invention, which, if of merit and successfully placed on the market, may bring in a very satisfactory, and in some cases an ample, income. There are also many instances in which goods of this character make for themselves a permanent place in the favor of the trade because of their superior quality. Many illustrations of the great value of a trade-mark will occur to our readers, even in these days when low price has so much to do with the marketing of commodities. One great advantage connected with the manufacture of specialties as contrasted with staple goods is that an opportunity is afforded for their manufacture on a smaller scale, thus giving parties with less capital a foothold in the market.

Another unintended compliment to American petroleum has been paid by European interests. We noted not long ago that American oil had been barred from use by the Metropolitan District Railroad of London, except for signal lamps and lanterns, where the smokelessness of the American product made its use essential. Now it is further reported that the railroad management in Cassel, Germany, has also ordered that American oil be used only for office lamps and signal lanterns, and that the Russian petroleum is to be used for all other purposes. This is a pretty clear recognition of the superiority of the American oil over the Russian.

The Senate Committee of Commerce last week reported favorably Senator Nelson's bill for the creation of an executive department of the Government, to be known as the Department of Commerce, which provides for a new cabinet officer, to be known as the Secretary of Commerce, together with a complete staff of secretaries and officials. Under the new department it is proposed to include the Life Saving Service, Light House Board, Marine Hospital Service, Bureau of Navigation and United States Shipping Commissioners, Steamboat Inspection Service, Bureau of Immigration, Bureau of Statistics, United States Coast and Geodetic Survey, the Railroads Commission, Census Office, Patent Office, Department of Labor and Bureau of Foreign Commerce, now in the State Department. A Bureau of Manufactures and a Bureau of Mines and Mining are also established. The new department is designated to promote commerce and furnish all information bearing upon commerce and industry, thus relieving the Treasury Department of a vast amount of work, much of which is of an extraneous nature, now performed by that department.

The directorate of the South Carolina Interstate and West Indian Exposition, now open at Charleston, S. C., announce that there is yet some available space for exhibits in several of the buildings, and that a few lines of manufacture are not so far represented at all. They therefore invite exhibitors to take advantage of the favorable opportunity to advertise their goods at this exposition. The exposition, they say, will not be fully completed or at its best before the middle or latter part of this month, and the largest attendance will be from February to May, when the Florida travel will increase it. The generous plan and scope of the exposition is not fully realized by the public at large. Its buildings are larger than those of the exposition at Omaha, Atlanta or Nashville, and the floor space in many of them equals the Pan-American. The managers believe that this exposition offers an unusually favorable opportunity for the reaping of good results by exhibitors.

Testimony as to the value of the consular reports printed by the State Department for the information of the merchants and manufacturers of the United States is constantly being rendered, and shows that these reports are very widely read. A recent communication from United States Consul Grout of Malta bearing upon this subject is of interest. Mr. Grout expresses surprise at the wide popularity given to the consular reports, and mentions that some months ago he sent a report upon refrigerators, since which time he has received newspaper clippings referring to this report, not only from the United States, but also from England, France, Germany, Switzerland and Austria. In the above mentioned report Mr. Grout gave the addresses of the parties in his consular district likely to be interested in refrigerators. As a result the desks of the merchants named were covered with refrigerator catalogues in various languages.

Doing Business in the Persian Desert.

British commercial missionaries certainly penetrate to the uttermost parts of the earth. Not, possibly, with a rifle in one hand and a Bible in the other, but, as in the case under notice, with tea in both hands. One of these indefatigable persons has recently proselyted in Southern Persia, and a most interesting narrative of some of his happenings is published at length in the Journal of the Society of Arts. Even in the desert he pursued his avocations and endeavored to obtain orders from individuals with names indigenous, such as Seith Suleyman and Mohammed Ali Brothers and others. These sons of the soil were by no means averse to trading, and were exceedingly well posted up on prices, so if the English missionary intended to treble them, as the natives did in hiring him camels, he made an error, and was forced to drop to the list and discounts on the start, if he meant to do any business. In the desert shops the traveler found most amazing stocks of goods; to wit, white duck, all sorts of cotton prints, canned goods, grenadine, plush, sparklets, boots, ladies' shoes, lamps, chandeliers, lithographed pictures, scent bottles, mats, cigarettes, carpets, stationery of all kinds, medicines, clocks, glassware, tea pots, furniture, padlocks, hat racks (in a land of turbans!), fancy match boxes and jewelry. The traveler told the merchant that he could not see where he got his trade from, which was a little impertinent, but the trader said that customers were plenty, and he got his money back. The British banking system is in force, and it is not at all difficult to obtain funds at almost any point along the routes of the caravans. The Persian Government collects duties upon all goods entering their country to the amount of 5 per cent., taxing the cost of carriage as well as the invoices! So it appears that the "heathen Chinee" is not the only one who has "tricks that are vain and ways that are peculiar." Every fourth or fifth shop in the desert is a tea shop, and the general preferment is for Chinese teas, as against the more expensive Ceylon and India teas; an enormous quantity in the aggregate is sold. Deliveries of orders are somewhat slow at present, but this will be remedied in the near future by railway lines now in course of construction by both the Russian and German Governments.

The net earnings of the United States Steel Corporation in the nine months ending December 21, 1901, are officially reported to have been $84,779,298, or a monthly average of nearly $9,500,000. The sum of $11,400,000 was paid in interest on bonds for the nine months and $42,005,807 was paid out in dividends, the balance available for surplus amounting to $19,444,497.

The Gasoline, Oil and Gas Stove Consolidation.

We recorded in our last issue the organization of the American Stove Company, with an authorized capital of $5,000,000. The new corporation includes the following nine concerns, constituting most of the leading manufacturers of gasoline and oil stoves and gas stoves and appliances:

Ringen Stove Company, St. Louis.
Quick Meal Stove Company, St. Louis.
George M. Clark & Co., Chicago.
Schneider & Trenkamp Company, Cleveland.
Standard Lighting Company, Cleveland.
Dangler Stove & Mfg. Company, Cleveland.
National Vapor Stove & Mfg. Company, Lorain, Ohio.
Monarch Stove & Mfg. Company, Mansfield, Ohio.
Twin Burner Vapor Stove Company, St. Louis.

It had been known for many months that negotiations were proceeding for the consolidation of these interests into one company, but obstacles of various kinds were encountered from time to time, and it would frequently appear as though it was impossible to adopt a plan on which all could be brought together. The announcement of the consummation of the scheme, therefore, comes as a surprise to the vapor, oil and gas stove trade. The negotiations were completed the past week under the direction of Ritcher, Montgomery & Hart, lawyers, of Chicago, and the company began business on January 6.

The new company will include, as above stated, the leading companies engaged in the manufacture of vapor, oil and gas stoves. This consolidation, however, will not be a monopoly, as several good sized manufacturing establishments engaged in the production of vapor stoves will continue to operate independently. In the oil stove business are also to be found some important independent manufacturers. The gas stove trade presents a still wider field, as the manufacturers in this line are much more numerous, including quite a large number of manufacturers of coal stoves who are also engaged in the production of gas stoves and ranges. The purpose of the new company, therefore, is not to endeavor to monopolize any branch of the stove trade, but to secure economies in the marketing and delivery of their products which will enable those interested in the company to secure better returns on their investment. They have for a long time been suffering from competition with one another in the cheaper classes of stoves, which are used most extensively. The prices of such stoves have been frequently down to cost or even below it, and it is expected that hereafter a basis of better prices can be maintained.

The new company will also be an important factor in the steel trade, as several of the constituent companies have been prominent in the manufacture of steel ranges and will continue to produce this class of goods. All the constituent companies have transferred their entire properties to the American Stove Company, including their steel range business.

The officers of the American Stove Company are as follows:

President, C. A. Stockstrom, St. Louis.
First vice-president, George M. Clark, Chicago.
Second vice-president, D. A. Dangler, Cleveland.
Third vice-president, F. L. Alcott, Cleveland.
Secretary, H. J. Trenkamp, Cleveland.
Treasurer, George F. Fiske, Chicago.

The Executive Committee is composed as follows:

C. A. Stockstrom, St. Louis.
F. L. Alcott, Cleveland.
George M. Clark, Chicago.
H. J. Trenkamp, Cleveland.
D. A. Dangler, Cleveland.
E. H. Stockstrom, St. Louis.
Geo. F. Fiske, Chicago.

The Board of Directors is as follows:

C. A. Stockstrom, St. Louis.
John Ringen, St. Louis.
Louis Stockstrom, St. Louis.
E. H. Stockstrom, St. Louis.
George M. Clark, Chicago.
George F. Fiske, Chicago.
Paul Schneider, Cleveland.
Henry Trenkamp, Cleveland.
H. J. Trenkamp, Cleveland.
F. L. Alcott, Cleveland.
W. H. Boardman, Cleveland.
D. A. Dangler, Cleveland.
D. E. Dangler, Cleveland.
O. P. Moon, Lorain, Ohio.
E. C. Baxter, Mansfield, Ohio.
A. E. Ambs, St. Louis.

The main office of the company will be located at St. Louis, but offices will also be maintained at Chicago and Cleveland. All plants of the constituent companies will continue to be managed as heretofore by their own officers, and the stove trade will, therefore, practically observe no change in their relations with the establishments by whom they have heretofore been supplied. All contracts taken before the consummation of the consolidation will be filled strictly according to the terms of such contracts.

F. L. Alcott as general manager and O. P. Moon as assistant manager will have charge of the five plants in the Cleveland division. The Harvey, Ill., plant will be in charge of George M. Clark, and those in St. Louis will be managed by Louis Stockstrom and A. E. Ambs. The same force of salesmen, with some addition to their ranks, will represent the several houses on the road.

The American Stove Company will start out with a bonded indebtedness of $750,000, the bonds being in denominations of $1000, bearing 5 per cent. interest, and with a working capital of upward of $1,200,000. The bond issue is based on a deed of trust, covering the properties of the constituent companies, taken by the Equitable Trust Company of Chicago, the bonds being made payable at the Lincoln Trust Company, St. Louis. These bonds are redeemable in blocks of 50, beginning July 1, 1903, and in the same month every year up to 1917. All the stock of the company and the entire issue of bonds are held by persons interested in the new company, and it is stated that none of the stock or bonds will be placed on the market. It is further stated that the earnings for 1901 of the plants acquired were sufficient to meet all fixed charges, pay a 6 per cent. dividend upon the capital stock of the new company and leave a surplus of $50,000 for the retirement of bonds.

NEW YORK STATE STOVE MEN ADVANCE PRICES.

A meeting of the Western New York and Northern Pennsylvania Stove Manufacturers' Association was held at the Waldorf-Astoria Hotel in New York City on Wednesday, January 15, when a full discussion of the various conditions existing in the trade was held and an advance of 5 per cent. in the price of stoves was decided upon. It was the general impression that there had been no remuneration to the manufacturer in the prices ruling on oak stoves, and it is probable that these goods will be subjected to further advances.

THE ASTOR HOUSE STOVE ASSOCIATION.

Now that an advance in the price of stoves has been made by the New York State manufacturers and the Pennsylvania manufacturers, and promised by the Pittsburgh manufacturers, and that some of the contentions in the Philadelphia market have been settled under a new agreement, there is strong evidence that the stove manufacturers feel that advances in prices were necessary to the conduct of their business at a profit. The only associations which have not already taken a step in this direction are the New England Association, which has the matter under consideration, and the New York Association, which formerly met at the Astor House. Evidently there is a feeling that if the manufacturers in any section fail to keep step with their colleagues, the influence is likely to be detrimental to the interests of all.

It is probable, in view of these facts, that Secretary Thomas J. Hogan of the National Association of Stove Manufacturers, who spent some time in New York City this week, consulted with the members of the local association on the advisability of either reviving the old

association or reorganizing it on a new basis. There is a strong hope that success will attend his efforts, now that some of the dissenting members have reached an agreement and adjusted their differences. Some of the old members are strongly of the opinion that, whatever else is done, the association should secure the services of an official who will give his entire time to its interests. This experiment is said to have proved very satisfactory to the large membership of the Pennsylvania Association. It seems perfectly clear that whatever is done should be done quickly before any orders are booked for the year. The right man in such an official position would prove invaluable if he could encourage the members to hold throughout the year to the prices which they agree upon early in the season.

Banquet to Stove Salesmen.

Brief reference was made in these columns last week to the annual conference of salesmen and agents of the Reading Stove Company, which was held at the home office in Reading, Pa., and to the banquet which was given to the representatives of the company at the Mansion House. The latter feature was the occasion for the expression of much good will and friendly feeling, and will long be remembered by the participants. The banquet hall was tastefully decorated and the following *menu* served:

Blue Points.
Celery. Tomato Soup.
Lobster à la Newburgh.
Green Peas.
Young Turkey Stuffed. Cranberries.
Braised Sweetbreads. Potatoes.
Lettuce with Mayonaise.
Vanilla Ice Cream. Fancy Cakes. Cheese.
Crackers. Coffee.
Cigars.

President W. Harry Orr presided and welcomed the party, after which Mr. Essick took his place as toastmaster. A dozen of the banqueters made responses and the brightest prospects for the new year were predicted. The guests were:

Directors: W. Harry Orr, president; Edgar Amole, treasurer; C. H. Williamson, superintendent; W. H. Luden, Jesse Posey, R. P. Shick and C. H. Shick.

Main Office: Wm. S. Essick, secretary and general manager; F. L. Connard, manager heating department; J. C. H. Lynn, chief clerk; Daniel Amole, foreman shipping department.

Reading Salesmen: Jos. W. Sheeler, C. C. Hornung, W. H. Kurtz, C. A. Barker, F. Ruoff, F. C. Steltz, T. W. Fagan and W. H. Shick.

Boston Branch: Walter H. Billings, manager; Alex. C. Burke, salesman.

Philadelphia Branch: Wm. Thomson, manager; A. J. Eickmeyer, W. H. Clark and George E. Eben, salesmen.

Chicago Branch: John H. Ross and John Kontny, managers.

Reading Foundries: Nathan Gates, James Gossler, John A. Kline, Richard Riddington, C. W. Irwin, W. H. Rhoda, Horace Grander, E. S. Miller, W. A. Deeter, E. C. Auman and Bertram Shaner.

Dayton Foundry: Zenas A. Craig, superintendent, and W. M. Kingsbury, salesman.

Guest: Harvey J. Fueller, statistical reporter.

The Abram Cox Stove Company.

The Western branch of the Abram Cox Stove Company, under the management of Charles A. Rusco, whose headquarters are at 19 West Lake street, Chicago, has enjoyed an unusually prosperous year. The territory covered by this branch is larger than that under the control of any of the Western branches of the other large stove companies. It includes Ohio and every State west of it. Since taking charge of this branch Mr. Rusco has greatly enlarged the Western business of the company. He shipped out from February 1 to August 30 $61,000 worth of stoves more than in the best 12 months he ever had with the company he formerly represented. Under his management Novelty stoves have gained such a strong hold on Western trade that numerous voluntary testimonials have been received from stove dealers in every section covered, expressing their pleasure with the manner in which these goods have found favor with their customers. The only disappointment during the year arose from the fact that dealers were not able to get all the stoves they wanted. The condition of business during the hight of the season is indicated by the fact that with the exception of a few days early in the month not a single salesman was on the road in September, simply because the sales had at that time exceeded the ability of the company to make shipments. More stoves were sold in the first six months of the year than the Western branch had expected to sell the entire year. The furnace trade also showed a heavy increase.

Arrangements are now under way which will greatly increase the supply of Novelty stoves for the coming year. The company are building a new foundry and warehouse at their works at Landsdale, Pa., and increasing the size of their mounting department. The molding room of the new foundry will be 150 x 250 feet in size, and after it is completed the company will employ as many molders as any stove company in the United States. The building used for mounting purposes, which is now two stories high, will have a third story, and its length will also be extended, thus giving it much greater capacity. The heavy Western trade has added so greatly to the business of the company that the foundries have been able to run on full time during the whole of 1901. The enlargement made, it is hoped, will enable the company to take care of all orders this year as rapidly as they are received.

Preparations are now being made to do twice the Western business done in 1901, and if the demand exceeds this the company will make still further enlargements to meet the requirements of the trade in 1903. Arrangements have been made to bring out three new lines of base heaters for the coming season. The line of cast ranges will also be enlarged by the addition of three new sizes.

The Western branch will be represented this year by the following traveling force: Warren W. Rusco and W. W. Barrick in Chicago and suburbs, O. C. Harrison in Wisconsin and the Northern peninsula of Michigan, T. M. Gilfillan in Minnesota, North Dakota and South Dakota; C. H. Parmelee in Washington, Montana and Idaho; L. A. Munn in Iowa, Walter M. Hogan in Illinois and Southern Michigan, W. F. Garretson in Indiana and Ohio, Howard Reed in Kansas and Oklahoma, and Lewis H. Painter in Nebraska and Colorado. Most of the force named have been with Mr. Rusco for the past six or eight years, and have therefore thoroughly demonstrated their qualities as salesmen. In recognition of the services rendered during the year he made every salesman a Christmas present of a valuable English silk umbrella of the finest character.

Hemp & Co.'s New Quarters.

Hemp & Co., manufacturers of air tight heaters and patent stove pipe, also makers of special goods for the trade, have now permanently located in their new factory at Second street and Chouteau avenue, St. Louis, Mo., which is equipped with new and up to date machinery and possesses a greatly enlarged capacity. On July 23 last, it will be remembered, this firm had the misfortune to lose by fire their entire plant, all goods made up ready for shipment and all machinery and material on hand, the only things saved being their account books and files. They secured temporary factory quarters at the St. Louis Stamping Company's building on Main street and Cass avenue, purchased new machinery and materials, and immediately started up to fill the requirements of old contracts, but refusing all new business. We are glad to announce to the trade that they are now housed in brand new buildings on the old site, the main building being 110 feet front, 211 feet deep and three stories in hight. In order to guard against a recurrence of a fire they have put up a separate building on the opposite side of the street for their japanning and enameling departments.

The Kelsey Heating Company, Syracuse, N. Y., are sending out with a card bearing the inscription "With Best Wishes for 1902" a vest pocket memorandum book in white celluloid covers giving their address and calling attention to the Kelsey Warm Air Generator. *Fac-similes* are given of the medals of highest award received by the company at the Pan-American Exposition.

Henry Cribben.

Henry Cribben of Chicago is now believed to be the oldest practical stove manufacturer connected with the trade. Mr. Cribben has been engaged in this line as molder and manufacturer for the long perlod of 51 years. He is still regularly to be found in the office of the Cribben & Sexton Company, taking an active interest in the affairs of that company. Mr. Cribben is enjoying vigorous health, and bids fair to continue many years more ln harness. He has achleved the distinction of having been the most successful of all the members of the stove trade connected with the development of the industry at Chicago. His connection with the Chicago stove trade dates from 1873, when he located in that city as the Western representative of the Co-operative Foundry Company of Rochester, N. Y., of which company he was president. He then purchased the company's Chicago stock of stoves, and forming a partnership with the late James A. Sexton, established a stove jobbing house. In 1878 they built a small foundry on part of the ground now occupied by the extensive works of the Cribben & Sexton Company and began to manufacture. Mr. Cribben's career covers many vicissitudes in the stove business as well as stirring incidents in which he frequently had occasion to show his grit and his qualifications for leadership. He managed the interests of the stove manufacturers during the great molders' strike in 1887, which resulted in the complete victory of the manufacturers, but was of more importance in bringing about improved relations between the manufacturers and the stove molders, through which peace has since been maintained without a break. Mr. Cribben's recollections of the ups and downs in the stove trade are vivid, and his conversation is replete wlth reminiscences of the most interesting character.

Fortune Gas Goods Plant.

For several years the Thomas-Roberts-Stevenson Company of Philadelphia have been devoting some attention to the manufacture of gas heating appliances in every way worthy of the name Fortune, by which they are familiarly known to buyers of gas goods. The demand for their line has grown to such an extent that they are now about erecting a separate plant for the manufacture of the Fortune gas heaters and cookers. Thls building will be 50 x 150 feet in size, affording a large floor space for assembling and finishing the castings, whlch wlll be made ln thelr regular foundry. This plant will be equipped with modern machinery and every facility for the production of carefully fitting and perfectly operating goods of attractive design and finish.

The Kalamazoo Stove Company.

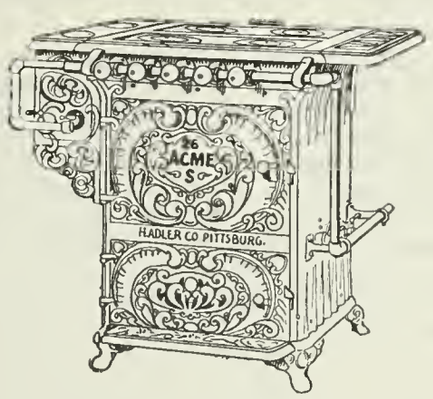
It is expected that the new Kalamazoo Stove Company, Kalamazoo, Mich., will have their stove foundry in running order by the latter part of February. The buildings have been completed and are now being equipped. These buildings consist of a one-story foundry, 120 x 150 feet; a mounting building and warehouse, 150 x 200 feet, and a power house, in the immediate vicinity of both, containing two boilers, a large engine and a dynamo. The machinery will all be operated by electricity, power being thus easily transmitted to any part of the plant. The buildings are entirely constructed of cement, which is claimed to make them more absolutely fire proof than if constructed of either stone or brick. It was the intention at first to build only the foundations of cement, but the work proved so satisfactory that the walls of the building were completed with the same material, the only break in the solid cement being a narrow belt of brick in which the joists are set. The molding shop is equipped with a 67-inch Byram-Colliau cupola, having a capacity of 35 tons a day. The foundry will be large enough to accommodate 65 molders.

The statement is made that the company will sell their product directly to the user. The present plans of the company contemplate the exclusive use of newspapers and other advertising media to get their business before the people, avoiding the employment of travelling salesmen. The officers of the company are as follows: President, Edward Woodbury; vice-president and general manager, William Thompson; treasurer, C. A. Dewing; secretary, A. H. Dane.

The Acme Gas Range.

We present herewith a general view of one style of Acme gas range which has been got out by H. Adler & Co. of Pittsburgh, Pa. The sides of the range are made perfectly plain, but are heavily ribbed at the weak points. The company state that their reason for not using an ornamental side is that all their ranges are full asbestos lined and tightly cemented, so that no air whatever can come between the asbestos lining and the iron, thereby affording condensation between them, which would rust the oven in a very short time. This can only be done where the parts are perfectly flat. The plain cast side, it is said, can also be made lighter than the ornamented, and the less iron there is in the body of a range the less heat it will absorb.

All the burners in the Acme range are constructed and adjusted in such a manner that they will operate to entire satisfaction on low or high pressure, without the gas catching at the valve orifice on the lowest pressure or burning yellow on the highest pressure, and without changing the valve orifice in any of the valves after the mixer collars have been set properly for the gas on which the range is being used. The Acme is made in sufficient variety to meet many requirements and is referred to as first class in all respects.



The Acme Gas Range.

Keystone Stove Foundry.

As previously reported in *The Metal Worker*, the Keystone Stove Foundry of Spring City, Pa., were incorporated under the laws of the State of Pennsylvania with a capital of $60,000. This company bought the patterns and plant of the Schuylkill Valley Stove Company. At a meeting of the stockholders, held last Tuesday, the following directors were elected: E. B. Colby, H. N. Cole, W. J. Dykes, J. Edgar Diemer and M. Diemer. The Board of Directors immediately organized and elected E. B. Colby president and treasurer, H. N. Cole, vice-president; George M. Millspaugh, secretary, and J. Edgar Diemer, superintendent. The company will manufacture a line of coal stoves and ranges under the name Keystone. Preparations are being made to start up the plant with about 40 molders on the last of the month. The new company already have a number of popular stoves and ranges, and new additions will be made to the line during the year.

THE calendar for 1902 that is being distributed by the Quakertown Stove Company of Quakertown, Pa., 37 and 39 North Second street, Philadelphia, calls attention to their line of Ranges, Stoves and Furnaces, and also the Dangler Gas, Oil and Gasoline Stoves, which they handle. The principal feature of the calendar is a picture showing a gentleman of the old school presenting to his bride one of the Leader Ranges.

ODD PLATES.

A VERY pleasant "Daily Reminder" of the Phillips & Clark Stove Company of Geneva, N. Y., and of the Andes Stoves and Ranges, which they manufacture, comes to those who receive from the company one of the calendar engagement books which they are distributing under the title above noted. Weekly sheets, 5½ x 8½ inches in size, with blank spaces for notes against each date, are bound together in a cloth cover, each sheet being perforated so as to be readily removable after having been used. The company are also sending out a neat little memorandum book bound in celluloid and bearing on the cover their name and address, together with a reference to the Andes Stoves and Ranges. Inside of the book is a quantity of useful information, such as the rates of postage, interesting tables, statistics of population, weights and mensures, &c., together with calendars for 1902 to 1904.

A LARGE addition is being made to the plant of the Snyder & Baker Stove Company, Belleville, Ill., to be equipped with the latest machinery for the manufacture of a complete line of Steel Cooks and Ranges. It is expected that this department will be in full operation by March 1 next. The name selected for this new line is Early Meal, and they will be made in four different styles. The company will continue to make their well-known line of Stoves and Ranges, and they say that many new features of interest will be embodied in their new catalogue about to be issued.

GEORGE H. BARBOUR, vice-president and general manager of the Michigan Stove Company, issued a circular to the trade under date of January 2, announcing that the management of the company's Chicago house has been intrusted to Robert L. Morley, who for the past 18 years has filled the position of associate manager, and that J. B. McKewon will be associated with him in the management. He bespeaks for the new management the confidence and co-operation of the trade, stating that it will be the company's aim in the future, as in the past, to make Garland Stoves and Ranges "household words" and maintain the high reputation they have enjoyed. The company are also sending to the trade neat announcements of the particular traveling salesman who will call upon them in the interest of the company. This announcement is printed in gilt on a heavy black card in the shape of a shield, having a miniature calendar for 1902 attached at the bottom.

A VISIT to the foundry of the Belleville Stove Works, Belleville, Ill., finds them in the midst of active preparation for the coming season's trade. New goods and improved features in the old lines will be prominent in their line for 1902, and it will pay all dealers to send application for their new catalogue soon to be issued.

THE WESTERN ÆOLIPYLE COMPANY have removed their office and warerooms from Lake and State streets to 134 Lake street, Chicago. They exhibit their device in operation as attached to a furnace. The company are meeting with encouragement in introducing this fuel saving device, which has been illustrated in these columns, to the citizens of Chicago. It consists of an attachment to the smoke pipe of any heating apparatus, introducing at this point a current of air, which is claimed to secure more perfect combustion of fuel.

THE DOYLE AIR BURNER COMPANY have established a salesroom at 132 Lake street, Chicago. In this salesroom they exhibit their heating apparatus in various forms. The company have adapted the Doyle principle of combustion to their own construction of Gas Heaters, Parlor Heaters, Base Burners and Hot Air Furnaces. The principle covers the admission of heated air at a point where it is thoroughly mixed with the gases as they arise from the consuming fuel, the ignition of these gases causing a secondary combustion to take place. The company claim that, with their principle, bituminous coal is burned with most satisfactory results. They have a report of a careful test made by Skinner & Sethman, a prominent firm of engineers of Denver, Col. A test of one of the Doyle Heaters against one of the best Heaters of the ordinary type showed that for every 61 pounds of coal used by the other Stove the Doyle Stove required only 15 pounds and 2 ounces to maintain the same temperature. The company claim that one of their Hot Air Furnaces with an 18-inch grate will heat up to 50,000 cubic feet of space, and that soft coal is the ideal fuel for this type of Furnace construction. The Heaters constructed on this principle are adapted to the use of any combustible matter whatever.

IT is reported that a new Stove foundry is shortly to be established at New Berlin, Pa.

THE CLEVELAND STEEL RANGE COMPANY, Cleveland, Ohio, inform us that C. H. Hostetter, formerly manager of the Odin Stove Mfg. Company, Erie, Pa., has accepted the position of manager of their Gas Range and Gas Appliance department. The company are sending out a four-page folder giving half-tone engravings of their Gem Ideal Gas Ranges. They state that in Mr. Hostetter's care the improvements in their Grand Ideal and Gem Ideal Gas Ranges will be pushed, and the trade are assured that nothing better in the line of Gas Appliances can be secured. The company invite the trade to secure circulars and to correspond with them when in need of either Gas or Coal Ranges.

THE SPRINGFIELD FURNACE COMPANY, Springfield, Ohio, have been busy in bringing out a new pattern of the Thompson Gas Furnace for warm air heating. They state that the demand for their Furnace has been greater than they could supply, necessitating the postponement of the construction of the Thompson Furnace using oil fuel. A recent order from Pittsburgh called for 13 of their gas burning Furnaces. The company have recently applied for some new patents to be embodied in their new construction, which will be pushed to the extent of the facilities of their manufacturing plant.

A. WEISKITTEL & SON, Baltimore, Md., are sending to the trade a circular of their White Porcelain Enameled Top Fire King Gas Range, accompanied by a circular letter pointing out the advantages of the Fire King line, and requesting the trade to correspond with them in reference to the goods.

CAREY A. MOORE was a visitor at *The Metal Worker* office this week. Mr. Moore is well known to the trade in Philadelphia, Baltimore and the Southern Atlantic States as the representative of the Acorn line of Stoves and Ranges made by Rathbone, Sard & Co., Albany, N. Y. He has largely increased their popularity and use in the territory named. Mr. Moore has recently visited the plant in Albany, and is now conversant with all of the features of his line for 1902 and the specialties which he will have to present.

CHAS C. HEATH & Co. of Baltimore and Philadelphia are now quartered in their new and commodious Philadelphia branch store and warehouse, 136 and 138 North Second street, where they are in possession of greatly increased facilities. Stove Repairs will be handled on an extensive scale, covering all lines of Stoves made in this country and particularly those made in the New York, Pennsylvania and Baltimore districts. A rather novel plan is proposed by the company in connection with this line. A special tag will be attached to all Stove Repair shipments, called their Gold Seal premium tag, which will entitle purchasers to premiums of various values. Henry Swartz continues in charge as manager of the Philadelphia branch and has the assistance of John Bell, in charge of the floors, and John Kahmer, in charge of the department of Stove Repairs. Both the latter are well known on Second street, having been connected with the Philadelphia Stove trade for a number of years.

GEORGE H. HOLLAND, vice-president and general manager of the Bridge & Beach Mfg. Company, St. Louis, has been compelled to spend some time at Boston, owing to severe illness, while on his way home from a trip to Europe. He will reach St. Louis this week. The many friends of Mr. Holland deeply sympathize with him in his affliction and earnestly hope for his speedy recovery.

THE COLUMBUS STOVE COMPANY of Columbus, Ohio, have recently been incorporated with a capital stock of

$50,000. The incorporators are J. W. Hastings, F. B. Everett, J. C. Campbell, S. E. Jones and G. A. Willing.

Charles C. Heath & Co., Baltimore, Md., are send- to the trade a 16-page pamphlet devoted to their National Hot Air Furnace, which is made in two styles, designated as the 200 and 300 Series. The 200 Series is a construction including a crab surmounted by an annular drum, through which the products of combustion pass before reaching the smoke outlet. The 300 Series has a large combustion chamber immediately above the fire with an outlet into an annular drum through which the gases pass to the chimney. Both series of furnaces are provided with labor saving grates, and made in five sizes, with casings 32 to 50 inches in diameter, and rated to heat from 15,000 to 60,000 cubic feet of space in residences, and from 20,000 to 80,000 cubic feet of space in churches or stores.

The Co-operative Stove & Foundry Company, Wheeling, W. Va., have just completed a year which has been a record breaker in their history. The plant, although not a large one, has been in operation every day of the working season, and has turned out a large amount of material for the market. The management look forward to a very gratifying volume of business for 1902.

The new building for the Excelsior Stove Company at Quincy, Ill., has been completed and is now ready for occupancy. The contractor had 60 days in which to finish the job, but completed the work in 50.

The Peninsular Stove Company, Detroit, Mich., set forth the merits of the Peninsular Planished Steel Range in a little pamphlet printed in colored inks, which they have issued. The special features of construction are separately illustrated and described in a way to render their operation clearly understood, while a number of general views give an idea of the various lines of Steel Ranges from which the dealer may select. A catalogue relating to the goods will be sent by the company to any one sufficiently interested to make application.

The Lennox Furnaces are considered in an attractively printed catalogue of 40 pages, which is being sent out by the Lennox Mfg. Company of Marshalltown, Iowa. The Furnaces are illustrated and described at considerable length, the salient features being discussed in a way to interest not only the dealer, but also the house owner. Directions are given for setting the Furnaces and diagams show how the brick work should be arranged. Tables are also provided showing the heating capacity of Furnaces, the size of cold air ducts, cold air register faces, warm air registers and pipes.

The Gurney Foundry Company, Limited, Toronto, Canada, are furnishing their friends in the trade with a poster calendar for the new year. It is of the regulation style, being bound at top and bottom with metal strips and having an eye for suspending upon the wall. The design of the poster is executed in colors and represents the interior of a kitchen equipped with an Imperial Oxford Range fitted with pipe shelves and elevated ovens. The cook has just taken from the oven a well browned turkey, and judging from the smile upon her face, the cooking has evidently been to her entire satisfaction. The leaves forming the calendar proper are attached to the lower portion of the poster.

Charles W. Goodnough has issued a circular to the trade calling attention to the fact that he has acquired an interest in the Prizer-Painter Stove & Heater Company, and that he will hereafter have sole charge of the business of the company in Western Pennsylvania, West Virginia, Western Maryland, Ohio and Kentucky. The headquarters for this territory will be at 717 Grant street, Pittsburgh, Pa., where ample warehouse and office facilities will enable the company to serve the trade promptly and satisfactorily. The circular carries a likeness of Mr. Goodnough, together with a *fac-simile* of the company's trade-mark.

Stanley Works, 79 Chambers street, New York, are selling representatives of the Hart & Cooley Company, New Britain, Conn., manufacturers of lines of Wrought Steel Registers and Ventilators, recently put on the market. These Registers, which are in an Indian lattice design, are made of stamped steel in japan, nickel plated and white enamel finishes regularly, or the surface can be finished in any style desired to harmonize with the interior. The same styles are made in all the regular sizes from 6 x 8 inches up. The Stanley Works will cover all the territory on this product that they cover on their own goods.

At Pittsburgh, an affidavit of defense was filed last week in the suit for $50,000 damages brought by the Monongahela Land Company against Graff & Co., Stove manufacturers in that city, whose business was taken over last year by the Pittsburgh Stove & Range Company. The plaintiffs owned property in Monongahela City, and to induce Graff & Co. to locate their works there conveyed to the concern 5 acres of land, and agreed to give a bonus of $25,000. The purchasers of lots were to pay the money to a trustee, the latter to hold it as security for the defendant company for the payment of this bonus. It was for the alleged breach of this contract that damages were asked. The defendant company deny they entered into the contract in bad faith, and say they were not obliged to show the plaintiffs any plans of the proposed plant. It is said there was collected from the sale of lots about $17,000, of which the defendant company received but $6425, although they expended $19,000 in removing their plant. It is charged that the plaintiffs expended $11,000 for other purposes. The defendant company claim the plaintiffs owe them interest on $7000 and $18,000, which was due when the contract was broken.

Wisconsin Retail Hardware Association.

The programme for the annual meeting of the Wisconsin Association has just been issued. As usual, it is in the form of a pamphlet, in which a number of advertisements appear, together with list of members, details of the convention, &c. C. A. Peck, Berlin, the energetic secretary of the association, under the heading, "A Few Words With You," refers in an introductory address to the work of the organization during the past year. He also makes the following appeal to nonmembers:

> Let me again most cordially invite you to "come with us and we will do you good." Don't wait until the meeting, but mail the secretary $2 to-day and that pays your dues until 1903.
>
> Don't try to save pennies by losing dollars. If you wait until you come into the annual meeting you may not come. Trade may keep you at home. You may feel too poor. You may have the smallpox or the baby may be teething.
>
> The one item of saving a large percentage on your fire insurance will of itself repay the item of dues many times over. Last year the membership who availed themselves of this privilege saved 35 per cent., and it looks as though they would save more this year.

The convention will be held at the Republican House, Milwaukee, on February 5 and 6. The following papers will be read at the meeting: "How to Build Up a Good Retail Business," by Fred. Kusel of Watertown; "Some of the Evils of the Trade," by F. Merbach of Ripon; "Relation of Traveling Men to Retailers," by H. L. McNamara of Janesville; "Benefits of National Union," by O. P. Schlafer of Appleton. Mr. Scofield of the Scofield Company, Sturgeon Bay, will also present a paper on a subject not announced.

Illinois Retail Hardware Dealers' Association.

As already announced, the annual meeting of the Illinois Association will be held in the commodious quarters of the Elks' Club, in Decatur, February 12 and 13. The headquarters of the association will be at the St. Nicholas Hotel. Members from Chicago and suburbs will probably travel to Decatur by special train, as the indications are that over 100 persons from that vicinity will attend the meeting. The convention promises to be a most interesting one, and a record breaking attendance is expected. Among those who will read papers are Chas. H. Williams of Streator, whose subject will be "Mental Equanimity;" ex-President Z. T.

Miller of Bloomington; H. C. Peppler, 700 Lincoln avenue, Chicago; Wm. T. Gormley, 78 East Randolph street, Chicago, and L. H. Clark of Rockford.

Cooper & McKee's Refrigerators.

An illustrated catalogue of their line of refrigerators and ice chests for the season of 1902 has just been issued by Cooper & McKee, 113-121 Gwinnett street, Brooklyn, N. Y. In it the place of honor is given to their glass lined refrigerators, which were first brought out last season and which, the manufacturers state, have proved an unqualified success. These refrigerators have been used extensively in hotels, restaurants and high class apartment and private houses in the Metropolitan district and also in the cities of the Northern, Eastern, Middle and Southern States with entire satisfaction. The makers claim that these goods represent the acme of high grade hygienic refrigerators, embodying all the important improvements modern science has devised. They are made of the finest materials. The warm and cold air flues are so arranged that a dry, cold, pure air is always in circulation and the food compartment with its doors is lined with 7-16-inch polished plate glass, all glass being set to glass, with ground edges, so that there is no metal or other material in corners to rust or deteriorate. The shelving is of aluminum, which will not rust, corrode or tarnish. Cuts of these glass lined refrigerators in natural colors are presented. They are made in nine sizes and styles.

The new Columbia refrigerators form another leading line to which special attention is directed. Both these lines of refrigerators are filled with "Neptune insulation," which, from its composition, is claimed to lessen compression, increase the storage of dead air and give additional insulation. They are also equipped with the company's new patent siphon, made of heavy japanned cast iron, screwed to the bottom of the refrigerator and so balanced that it is always in position and cannot fall off. Other goods illustrated and described in the present catalogue are Champion hard wood refrigerators, Household refrigerators, refrigerators specially designed for flats and apartment houses, also for delicatessens and restaurants, New Domestic refrigerators and ice chests, grocers' refrigerators and refrigerators for nursery use.

Enameled Steel Wares.

The National Enameling & Stamping Company, 81-83 Fulton street, New York, have issued, under date of January 1, 1902, their catalogue No. 3, illustrating and describing the various lines of enameled steel ware which they manufacture. In a notice to the trade the company explain that in their first catalogues an effort was made to include each and every item of enameled steel ware formerly manufactured by their predecessors. Experience has proven, however, that quite a few slow and poor selling items were embodied in the catalogue, and in issuing the latest publication their object has been to eliminate all such items and show only such goods as they make and carry in stock at all times, and which can be furnished promptly.

The present catalogue contains between 400 and 500 cuts, and gives the list price of each item. This list applies to the different styles of enameled steel wares, except ornamental wares, but is subject to different discounts, which will be quoted on application. In connection with each article listed there is also shown exactly in what different finishes it is made. The various finishes include Royal, National, Greystone, Granite, Venetian, Blue and White and all White. The company announce that since issuing their former catalogue they have decided to discontinue the manufacture of the Brilliant enameled steel ware. Seventy pages of the publication are occupied by the company's long line of enameled steel wares, and five pages at the end are devoted to ornamented enameled steel ware. This is of high artistic merit and embraces some very handsome goods, including jardinieres, cuspidors, water pitchers, cups and saucers, dinner plates, soup plates, chambers, &c.

Cape Cod Commercial Travelers' Association.

The fifteenth annual banquet and ladies' night of the Cape Cod Commercial Travelers' Association was held at the Parker House, Boston, on Friday, January 10. Over 100 ladies and gentlemen attended and the following, with President and Mrs. George E. Hunt, held a reception previous to the dinner: Hon. George A. Hibbard, postmaster of Boston; James J. Myers, speaker of the House of Representatives; Senator William A. Nye, Col. Charles K. Darling, Rev. George G. Hamilton, Hon. H. Heustis Newton, Charles B. Sanford, president Worcester Commercial Travelers' Association, and Walter C. English. The after-dinner exercises were in the hands of the retiring president, George E. Hunt of the Henry N. Clark Company, Boston, who made an admirable toastmaster. Music was furnished by the Royal Banjo, Mandolin and Guitar Club and Miss Maud Smith of Toronto, gave recitations. At the close of the dinner President Hunt delivered an address of welcome and introduced in turn each of the special guests, who responded with speeches. The affair was a success in every particular. The Executive Committee who planned the entertainment were Henry B. Black, Frank A. Gorman, Clarence W. Newman, E. Frank Withington, Charles E. Gill, W. R. Lapham, George A. Jerauld and the following Reception Committee performed their duties handsomely: William B. Seignious, chairman; George H. Gibson, Edward B. Slocum, Herbert W. Marshall, Gardner F. Packard, Edgar F. Power.

Preceding the dinner there was an election of officers for the ensuing year, the successful ones being as follows: Clarence W. Newman, president; Henry B. Black, vice-president; Arthur T. Knowles, secretary; Clinton E. Hobbs, treasurer; Charles E. Gill, Walter S. Haynes, Jr.; Charles A. Haines, George E. Hunt, W. R. Lapham, H. W. Marshall, George E. Jeraud, Executive Committee; George M. Carpenter, George E. Hunt, Sick Benefit Committee; Clinton E. Hobbs, W. R. Lapham, John F. Randall, Railroad Committee, and Andrew Hawes, Edward B. Slocum, Augustus D. Wonson, Auditing Committee.

The Derby Twentieth Century Can Opener.

The W. H. Plumb Novelty Company, Ansonia, Conn., are offering the can opener herewith shown. In use, after pushing the point of the opener through the center of the can, the knife is slid along on the bar to the



The Derby Twentieth Century Can Opener.

required distance from the point to cut the desired opening in the can. It is then locked in place by pushing down the small lever. The opener is referred to as being made of tool steel, tempered, and as being durable. It is explained that it is easily adjusted, that it will open any sized can, large or small, cutting out the top smoothly, and that no rough edge is left to cut the hands.

THE copartnership heretofore existing between J. P. Ford and H. P. Taylor, doing a retail Hardware business under the firm name of Ford & Taylor at Laconia, N. Y., was dissolved on January 9 by mutual consent.

PATTERN FOR LEADER OFFSET.

A New York correspondent writes us that he is putting up some square paneled leaders, to be connected to the hub of a round cast iron pipe, as shown in Fig. 1,

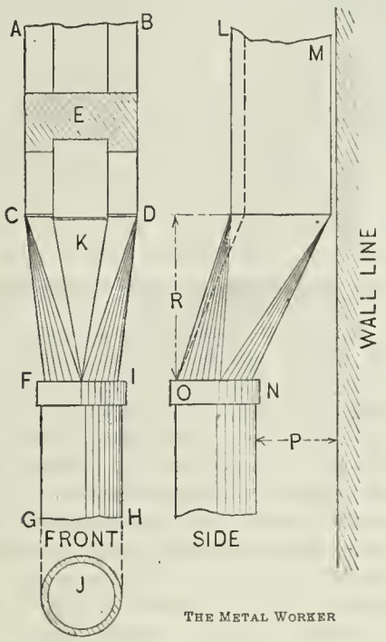


Fig. 1.—Reproduction of Correspondent's Sketch.

and asks us how to obtain the pattern of the offset. In Fig. 1 is shown a reproduction of our correspondent's sketch, in which A B C D is the front of the paneled leader, the section of same being shown by E, and F I H B the cast iron pipe. K shows the offset required to join the square leader with the round hub. J is the section of the iron pipe. L M N O shows the side view of the square pipe, offset and iron pipe, P indicating the distance that the iron pipe sets off from the wall, and R the required hight of the offset.

When getting out the shop pattern it is not necessary to draw the front or side view of the offset. All that is necessary is a plan view, as is shown in Fig. 2. Then, knowing the hight of the offset, the triangles will be constructed as will be described in connection with Fig. 3.

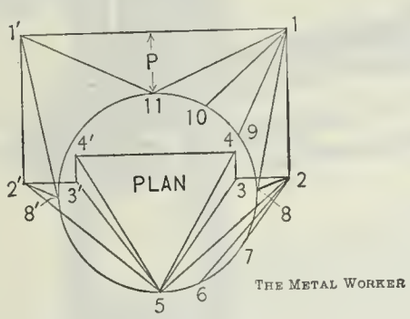


Fig. 2.—Plan and Bases of Triangles.

Thus in Fig. 2 let 1, 2, 3, 4, 4′ 3′ 2′ 1′ be the plan view of the square paneled leader, and 5 8 11 8′ the plan view of the hub of the cast iron pipe, P representing the distance that the iron pipe projects beyond the back of the square leader. As the iron pipe is central below the square leader, it is only necessary to divide one-half of the round plan as follows: Divide the quarter circles 5 8 and 8 11 into equal spaces, as shown by the small figures 5 to 11. From the corner of the square pipe 1 draw lines to 11, 10, 9 and 8, and from the corner 2 draw lines to 8, 7, 6 and 5. In similar manner from the corners 3 and 4 draw lines to the point 5 in the round pipe. The corner lines can be duplicated on the other half, if so desired. These lines form the bases of the triangles shown in Fig. 3. Erect any line, as 1 1′, equal to the hight that the offset is to have, as at R in Fig. 1. At right angles to 1 1′ and from 1 and 1′ draw lines indefinitely, as shown. Now take the various distances in Fig. 2 of 1 11, 1 10, 1 9 and 1 8 and place them on the horizontal line in Fig. 3, as shown by similar numbers, measuring in each instance from the point 1. Then from points 11, 10, 9 and 8 draw lines to the apex 1′. To avoid a confusion of lines erect another vertical line, as 2 2′. Then take the various distances in Fig. 2 of 2 8, 2 7, 2 6 and 2 5, and place them on the horizontal line in Fig. 3, as shown by joints 8, 7, 6 and 5, measuring from the point 2. Then draw lines to the apex 2′. From the point 5 erect the vertical line 5 5′. Take the lengths of the two lines in Fig. 2, 5 3 and 5 4, and measuring from the point 5′ in Fig. 3 by the same method obtain the points 3 and 4, from which draw lines to the apex 5. Then will these lines or hypotenuses represent the actual distances on the finished article on lines having similar numbers in Fig. 2. For the pattern proceed as is shown in Fig. 4. Draw any horizontal line, as 1 1′, equal to 1 1′ in Fig. 2. Now with 1′ 11 in Fig. 3 as radius and 1 and 1′ in Fig. 4 as centers describe arcs intersecting each other in 11. Now with radii 1′ 10, 1′ 9 and 1′ 8 in Fig. 3 and 1 in Fig. 4 as center describe arcs, as shown by 10, 9 and 8. Now set the dividers equal to the spaces into which the half circle in Fig. 2 is divided, and starting from the point 11 in Fig. 4 step from one arc to another, thus obtaining points 10, 9 and 8. From 8 draw a line to 1. Now with 1 2 in Fig. 2 as radius and 1 in Fig. 4 as center describe the arc 2, which intersect by an arc struck from 8 as center and 8 2′ in Fig. 3 as radius. Now with 2′ 7, 6 and 5 in Fig. 3

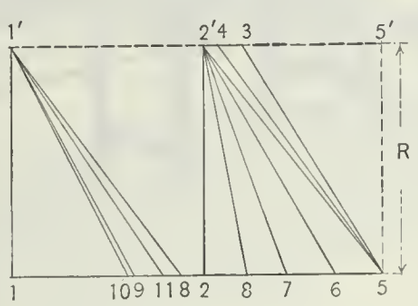


Fig. 3.—Diagram of Triangles.

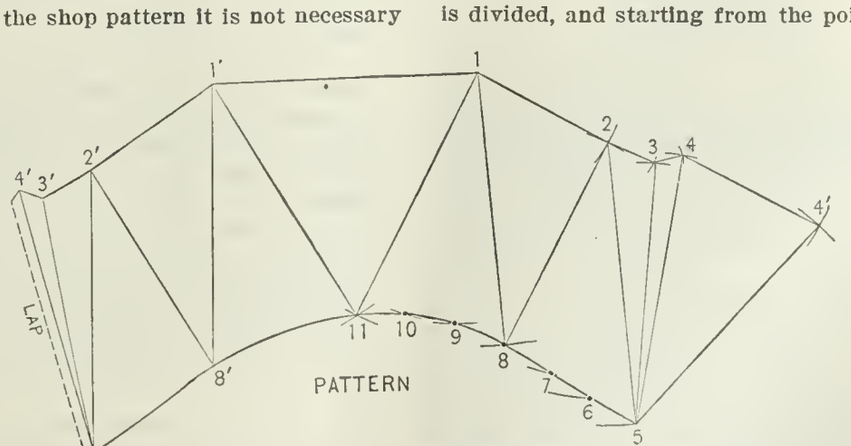
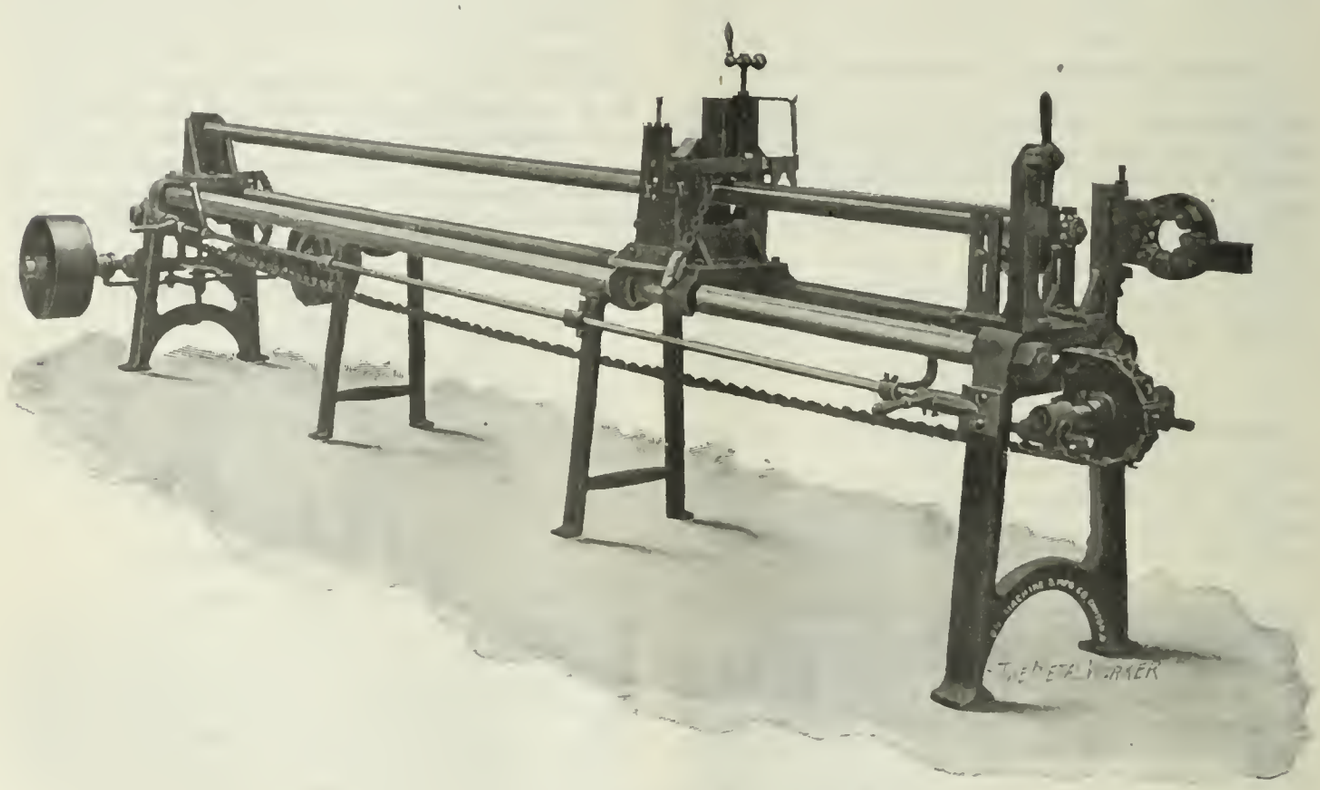


Fig. 4.—The Pattern Shape.

as radii and 2 in Fig. 4 as center describe the arcs 7, 6 and 5. Then set the dividers equal to the spaces in the half circle in Fig. 2, and starting from the point 8 in Fig. 4 step from one arc to another, thus obtaining the points 7, 6 and 5. From 5 draw a line to 2. Now with 2 3 in Fig. 2 as radius and 2 in Fig. 4 as center describe the arc 3, which intersect by an arc struck from 5 as center with 5 3 in Fig. 3 as radius. Draw a line from 5 to 3 in Fig. 4. Now with 3 4 in Fig. 2 as radius and 3 in Fig. 4 as center describe the arc 4, which intersect by an arc struck from 5 as center with 5 4 in Fig. 3 as radius. Draw a line from 5 to 4 in Fig. 4. Now with 4 4′ in Fig. 2 as radius and 4 in Fig. 4 as center, describe the arc 4′, which intersect by an arc struck from 5 as center and 5 4 as radius. Draw a line from 4 to 4′ and from 4′ to 5. Now take a tracing of 1 2 3 4 4′ 5 8 11 and place it opposite the line 1′ 11, as shown by 1′ 2′ 3′ 4′ 5′ 8′ 11. Then will 4′ 1′ 1 4′ 5 11 5′ be the complete pattern. Allow lap, as shown.

Power Conductor Pipe Corrugating and Grooving Machine.

The illustration given herewith represents a new 10-foot power conductor pipe corrugating and grooving machine for manufacturing corrugated conductor pipe, which is being manufactured by the Canton Machine & Mfg. Company, Canton, Ohio. The company have applied for a patent on this device. The following points are presented in connection with this machine: Corrugated or plain pipe of any one particular size can be made without making any changes whatever in the machine. After the pipe is seamed the corrugating head can be turned aside and the plain section of pipe stripped off the machine. A single and substantial sprocket chain operates the carriage containing the grooving appliance and rounding rolls. This chain is placed directly under the center of the machine and therefore is no hindrance to workmen engaged in the operation of the machine. The single chain is claimed to be an improvement over the double chain, since it is practically impossible to divide the tension between two chains. The carriage is supported by two 3-inch steel shafts, on which it is swiftly and noiselessly drawn. All sizes and styles of pipe, from 2 to 6 inch corrugated, plain round, octagon, &c., or any design for which heads can be made, can be manufactured on this machine by adding the necessary parts, but the machine requires no other changes. In operation, one forward and backward movement of the carriage rounds a curved pipe, and another forward movement passes a section of pipe through the corrugating head and off the machine. The carriage is stopped automatically and can be operated from either end of the machine. The capacity of this machine, which requires the labor of but two men, is said to be from 10,000 to 15,000 feet of pipe per day of ten hours. The company claim that their method of corrugating with partially incased steel walls is a great improvement over the wheel heads and corrugating mandrel, in that the pipe made on their machine is straighter, more uniformly corrugated and more securely seamed.



Power Conductor Pipe Corrugating and Grooving Machine.

A Seasonable Roof Cement.

When a thaw sets in after a snow storm the roofer has frequent hurry calls to stop the downpour of water inside of a building, due to some leak in the roof which the thaw has discovered. To enable the roofer to stop such leaks properly and with little trouble, George Callahan & Co., 218 Front street, New York, manufacture a rubber roof cement which will stick to a wet roof. It is said that this cement can be applied to a leaky roof during a rain storm, and will stop a leak either permanently or until some special repairs can be made by the tinner with his fire pot and soldering outfit. It is also claimed that wherever the snow can be swept away from a strained seam or a rust hole, the cement can be applied and the leak stopped. The cement has a considerable elasticity and never becomes hard, either in the can when kept in the shop or when applied to the roof; consequently, it never develops cracks to destroy its usefulness. The house also make a specialty of an oil manufactured for the express use of roofers, in addition to a full line of paints for galvanized iron and other sheet metal work.

The Twentieth Century Machine is the title given by S. J. Vance, Carthage, Mo., to his Automatic Roof Washer and Water Filter. It is designed to be connected with a conductor bringing rain water from a roof and to prevent the first dirty water that might come from a dusty roof finding its entrance to the rain water storage tank or cistern. This device is also manufactured by the New Process Mfg. Company of Dallas, Texas.

LARGER SHEET METAL WORKING MACHINES.

A marked development in the sheet metal trade of recent years has been the demand for machinery adapted to the handling of larger work than formerly. In the line of cornice machines, for example, the manufacturers of sheet metal machinery note a very pronounced change. Some 15 years ago the longest machine made for bending galvanized iron was 6 feet; subsequently inquiries were occasionally received for machines 8 feet long. A leading firm of sheet metal machinery manufacturers in the Central West consulted at that time with cornicemen as to the advisability of getting up patterns for a machine of that length. They were met with the objection that a cornice brake 8 feet long was impracticable, and were advised against going to the expense of getting up patterns for such a tool. As the inquiries for a longer machine kept coming in, however, the firm at length decided to get up a set of patterns for one, and they occasionally found a corniceman sufficiently progressive to buy an 8-foot machine. The market, however, is now so changed that the firm in question say that where they formerly sold ten 6-foot brakes to one 8-foot they now sell 20 8-foot brakes to one of 6-foot. Moreover, they are now getting inquiries for 10-foot machines, and have recently gotten up 10-foot patterns, believing that in the near future the demand for 10-foot cornice brakes will be as much greater than that for 8-foot brakes as the demand for 8-foot brakes now exceeds that for the 6-foot machines. As before, when proposing to increase the length of their machine, many cornicemen now declare that 10-foot galvanized iron cannot be handled properly, and that a 10-foot cornice brake will never be a success. The firm, however, are satisfied, from their former experience, that they are on the right track, and that in turning out a 10-foot brake they will meet the demands of modern requirements. The manufacturers of sheet iron have begun to manufacture longer and wider sheets and the tools to work these sheets must necessarily be increased in size and capacity in correspondence. The manufacturers referred to had a similar experience with their corrugating machine, used for corrugating roofing and siding for buildings. When they first began to manufacture these tools the demand was for 10-foot machines, and roofers declared that that was as long as they ought to be made, as a longer machine would not work properly. However, the manufacturers got up a 12-foot machine, and state that at the present time most of the orders received for these tools are for those of the longer length.

Sharon Tin and Sheet Mills.

The erection of the 12-mill sheet plant of the Sharon Sheet Steel Company, a subsidiary concern of the Sharon Steel Company, Sharon, Pa., is progressing well, and it is expected to be in full operation by May 1. The capacity of the sheet mills, when completed, will be about 100 tons per day. The 20-mill tin plate plant of the Sharon Tin Plate Company, also connected with the Sharon Steel Company is reported in full operation, with a daily capacity of 200 tons of finished material. The Sharon Steel Company own all the stock of the Sheet Steel Company, and about 60 per cent. of the stock of the Tin Plate Company. They propose to add to their present equipment four additional open hearth furnaces, making 12 in all. The Sharon Sheet Steel Company have an authorized capital of $500,000, and the Sharon Tin Plate Company a capital of $800,000.

Work on the plant of the Sharon Tube Company, another subsidiary concern, is being rapidly pushed, and the plant is expected to be in operation by June 1. The directors of the Sharon Steel Company have authorized the immediate erection of two blast furnaces, with an aggregate capacity of 700 tons a day, raising the company's pig iron capacity to about 1200 tons daily. The total authorized stock of the Steel Company is $5,000,000. The concern, with their various branches, include blast furnace, open hearth furnaces, blooming mill, billet mill, wire mill, pipe mill, tin mills and sheet mills, and will, when finished, be one of the most complete steel manufacturing plants in the country. The company were incorporated about two years ago.

Death of Christopher Zug.

Christopher Zug, one of the oldest citizens of Pittsburgh, and a pioneer iron manufacturer of Western Pennsylvania, died on January 13 at his home in Pittsburgh, at the patriarchal age of 95 years. Mr. Zug was born near Carlisle, Pa. His grandfather, Christian Zug, settled near the site of Letitz, upon land granted by the Penn family, and which is still held by the Zug family. Christopher Zug went to Pittsburgh in 1835 and ten years later joined the firm of Graf, Lindsay & Co., iron manufacturers. In 1864 the firm became Zug & Co. Mr. Zug was actively identified with the business of Zug & Co., Limited, until a few years ago. The firm are among the largest manufacturers of sheet iron in the country. The deceased was a thoroughly trained mechanical engineer, and studied out many improvements which have been utilized in the development of the modern rolling mill. His scientific knowledge was very broad and he was regarded as one of the leading botanists of the country. He was interested in many financial and charitable institutions in Pittsburgh, and was widely known for his philanthropic work, especially in connection with hospitals, having been on the Board of Management of several of those institutions in Pittsburgh. He was one of the founders of the Pittsburgh Bank for Savings and a director of that institution to the time of his death. Mr. Zug married Miss Eliza Bair of Hanover, York County, Pa. He is survived by a son and three married daughters.

Roof Cement and Paint.

Stowell Mfg. Company, 114 to 134 Culver avenue, Jersey City, N. J., are manufacturing two roof specialties in addition to their lines of prepared roofings, among which are gravel, cork and asbestos covered roofings, in addition to the plain asphaltum felts. One of the specialties is an elastic rubber roof cement, guaranteed by the manufacturers not to crack or become brittle, and designed particularly for repairing leaks in roofs, around chimneys, skylights, dormer windows, copings, gutters and elsewhere. It can also be used for securely fastening loose or broken slate and bedding tiles. Another commodity of similar character is black asphalt roof paint, for use on tin and iron roofs, bridges, gas tanks and underground pipes. It is said that tin roofs, even when rusted, broken and leaking, can be rendered water tight and serviceable with this preparation. It will withstand extreme heat or severe cold. It is easily applied and always ready for use.

FLASHINGS.

The Neighling-Steinhart Company and the New Jersey Sheet Metal Mfg. Company have been consolidated, with a capital stock of $150,000, under the name of the Neighling-Steinhart Mfg. Company. The location of the concern is Carlstadt, Bergen County, N. J. The directors are Edward A. Neighling and Alfred Steinhart of Carlstadt, Edwin L. Decker and Lewis A. Thompson of Somerville and John Dickens of New Brunswick, N. J.

N. & G. Taylor Company, Philadelphia, Pa., announce that in addition to the manufacture of Tin Plate, in which they have been engaged for many years, they are now in a position to supply from their mills Open Hearth Soft Steel Sheets for stamping purposes, also Plate Iron and Steel. The company are now prepared to ship from their mills Heavy Sheets between No. 8 and No. 18 gauge, in widths up to 48 inches and in lengths up to 144 inches.

The Parkersburg Iron & Steel Company, Pittsburgh, whose plant is situated at Parkersburg, W. Va., have purchased the plant of the Budke Mfg. Company, at Canonsburg, Pa., and will remove all the machinery to Parkersburg, where a stamping plant will

be erected adjoining the company's Sheet mill. It is expected that most of the company's Sheet production will be consumed in the stamping plant. John L. Budke has resigned his position as superintendent of the Canonsburg plant of the American Tin Plate Company and will become superintendent of the works of the Parkersburg Iron & Steel Company, in which concern he is already interested. Mr. Budke will be succeeded as superintendent of the Canonsburg plant by Joseph Phillips of Washington, Pa.

Mark McDonough of Carnegie, Pa., has been appointed to succeed N. L. Taylor as superintendent of the Denniston, Ohio, mills of the American Sheet Steel Company. Mr. Taylor has been transferred to one of the company's other plants.

Inspection of the books of the American Tin Plate Company for the months of November and December showed no variation in the price of Tin Plates, consequently there will be no change in the wages of the Tin Plate workers for January and February.

The Maryland Sheet Steel Company of Cumberland, Md., started three of their Sheet mills last week.

Three Tin mills have been placed in operation at the Chester plant of the American Tin Plate Company at Chester, W. Va., which they purchased from the American Sheet Steel Company. The other mills will be put in operation soon, together with the pickling and tinning departments. The company will also erect a corrugating plant in connection with their Chester mills.

Cummings Brothers, Holyoke, Mass., are engaged in roofing the new Dickinson Hospital which is being erected in Northampton. They have just completed a roofing contract in connection with St. James' Church in Springfield.

The Cincinnati Punch & Shear Company, Cincinnati, Ohio, have shipped to the American Frog & Switch Company of Hamilton, Ohio, a Punching Machine weighing 23 tons, which is said to be the largest machine of this kind yet built by the concern.

The new shops which the Wais-King Tool Company are erecting at Clifton avenue, Cincinnati, Ohio, adjoining the Baltimore & Ohio and Big Four railroads, are approaching completion. The company expect to be ready to fill orders by next week. The plant is located on 3½ acres of ground, upon which has been erected a main building, two stories high and 160 x 80 feet; also a boiler house and engine room, all of brick. The plant will be used for the construction and erection of the company's product, including Boring Machines, Mills, Punches, Shears, &c. At the start the company will employ about 100 hands. C. Wais, who for many years was at the head of the Wais & Roos Punch & Shear Company, will be the active manager of the mechanical department of the business, while Rufus King, Jr., will assume the responsibilities of the office management.

Neil M. Muirhead, Bridgeport, Conn., is placing Metal Ceiling and Siding in the store at the corner of East Main and Ann streets, Bridgeport.

Fire in the rolling mill of the National Enameling & Stamping Company, at St. Louis, Mo., on January 14, caused a damage estimated at between $60,000 and $75,000.

The remarkable development in the use of sheet metal for purposes for which cast metal or wood were formerly used is a pronounced feature of construction work to-day. As an illustration of this development the Ferracute Machine Company of Bridgeton, N. J., advise us that they recently furnished to a foreign government an outfit of machinery for making the sliding carriages which deliver the cartridges into rapid firing guns. These sheet metal carriages weigh only 2 pounds each, whereas the phosphor bronze carriages formerly used weighed 30 pounds and cost about ten times as much as those of sheet metal. Moreover, the sheet metal carriages have the additional advantage that a much larger number can be carried on mule back and other forms of transportation. The company have been officially advised that the carriages made by their machines have proved very successful in use. There is undoubtedly a growing tendency to replace castings and forgings with sheet metal in many different lines of work.

The Alan Wood Company have started work on their new plant for the production of Basic Open Hearth Steel. Five 50-ton furnaces will be erected, having a capacity of 100,000 tons of Steel a year. The new plant is situated at Ivy Rock, about 1 mile north of Conshohocken, and will extend over 175 acres of ground. The purpose of the plant is to supply the Alan Wood Company's Sheet mills at Conshohocken with Slabs and Billets. At the present time the company have to buy their Billets, and a considerable saving will be effected when the new plant is in operation.

A test of the fire proof qualities of Schratwieser's Patent Sheet Metal Lath, made by the Schratwieser's Sheet Metal Lath Works, 426-432 Third avenue, Brooklyn, occupying a week, has been made under the supervision of the Building Department of New York City, for the purpose of demonstrating the efficiency of that material. The Lath has been used extensively in elevator, dumb waiter, light and vent shafts in buildings in the vicinity of New York and throughout the country. Its features of merit are the excellent key surface which it provides for the mortar and the rigidity of the wall surface maintained by the bead which runs across the sheets at frequent intervals. The Lath is so made that it can be readily applied, and is especially adapted for the use of heating contractors who must cover their wall flues. The test resulted in a successful demonstration of its efficiency.

A. L. Hammerberg of the Tennessee Coal, Iron & Railroad Company of Ensley, Ala., has been appointed chief mechanical engineer of the Youngstown Iron, Sheet & Tube Company of Youngstown, Ohio. He was formerly connected with the Duquesne Works, and later with the Wellman-Seaver Company of Cleveland.

The Wheeling Roofing & Cornice Company of Wheeling, W. Va., have increased their capital stock from $50,000 to $500,000, and plans have been made for the erection of a new plant at New Martinsville, W. Va. Two buildings will be erected, one 90 x 220 feet, and the other 60 x 120 feet. A large amount of modern machinery will be installed.

The Canton Roll & Machine Company, Canton, Ohio, will erect an addition to their plant.

The Bradford Metal Stamping & Machine Company have been organized at Bradford, Pa., with a capital of $20,000, of which $15,000 is said to have been paid in. The concern are about completing a two-story building and expect to start business about February 1. They will manufacture Galvanized Finials, Cornices, Skylights, &c. O. W. Pierce of Olean, N. Y., is president and general manager.

The Consumers' Can Company, Baltimore, Md., recently incorporated with $400,000 capital, have taken over the business formerly conducted by the Consumers' Can Company of Baltimore, and have leased a large property in that city that will more than treble the capacity at that point. They expect to locate in their new quarters at Central avenue and Fawn street in February, and will have a capacity to use about 150,000 to 200,000 boxes of Tin Plate per annum at each plant. They are also negotiating for a site in the vicinity of Chicago for the location of a new plant.

The Ohio Galvanizing & Mfg. Company of Niles, Ohio, recently incorporated with $100,000 capital stock, have organized as follows: F. F. Bentley, president; W. H. Smiley, vice-president; A. J. Bentley, secretary-treasurer. Their new plant is nearly completed, and they expect to commence operations within a few days.

It is stated on good authority that a company will be organized at Louisville, Ky., to be known as the Louisville Steel & Iron Company, with a capital of $500,000, half of which is to be used for the erection of a plant for the manufacture of Steel Billets, Black and Galvanized Steel Sheets and other Steel products. It is understood that half of the amount necessary for the building of the plant has been subscribed. Davis, Kelly & Co. of that city are said to be interested.

CAST IRON BOILERS FOR LOW PRESSURE STEAM AND HOT WATER HEATING.*

BY DIRECTOR SCHIELE OF HAMBURG.

Translated from the German by Charles F. Hauss.

This subject was brought before you in 1896 by the late Engineer Strebel, whom most of you will remember. The manufacture of cast iron boilers in Germany had at that time only just been started in good shape. Hence we were then asked to refer to American makes and results for any knowledge of the subject. To-day things are different.

The beginning of the manufacture of cast iron boilers in Germany, as we speak of it to-day, dates back to the year 1894. This industry has rapidly grown, so that there are now quite a number of German factories that manufacture cast iron boilers. We have, therefore, seven years' experience, and I can assure you at the outset that the experiences have been good ones—at least where no sins were committed in the matter of construction.

When I now enter on the matter of material that goes into the construction of these boilers, there are two questions that arise in the comparison with wrought iron boilers. The one is, What is expected of the material in the construction and finishing? The other is, What advantages has this material to offer?

Cast iron has not the elasticity of wrought iron nor its flexibility. Therefore it is necessary to keep in mind that a body which is to be surrounded partly by fire, by smoke gases, by air, on one side, and by water or water and steam on the other side, must have every provision for expansion and contraction.

Owing to its liability to fracture it is necessary to avoid large flat surfaces, for if recourse is taken to ribs or stays, cast either inside or outside, to stiffen or strengthen the surfaces these may cause undesirable strains or fractures. Iron used in cast iron boilers should be close and soft, and particular attention must be paid to the cooling during and after pouring to avoid any undue strains in the castings. The maker must have every facility for thoroughly testing his castings.

I give you the following example of value of cast iron as a material for boilers: A colleague reported to me that a cast iron boiler was used during the entire severe winter of 1900-1901 on a closed tank or high pressure system of hot water heating in which the temperature of the water never was under 266 to 302 degrees F. The remarkable thing in connection with this is that the gases escaped directly into the air without a long smoke flue, yet the fire doors were always red hot, and the boiler has suffered no defect from its hard use.

The division of large cast iron boilers into sections is necessary owing to the kind of material used in their construction and manufacture.

The advantages offered by cast iron for boiler constructions are the following: The desired forms or shapes for the building of the fire chamber, fire surfaces and some flues are readily obtainable, and are so much in its favor as compared with wrought iron boilers as to make the value of its use beyond all doubt. The lower selling price and the possibility of using a water grate which can be a part of the section and adding to its fire surface must be looked upon as a special feature in its favor. The amount of space needed for a cast iron boiler is so much smaller that all of you probably thought or remarked when you first saw a cast iron boiler in use, when comparing it with the size of the house that it should heat, "This little boiler and that large house!"

The absence of rivet heads, offsets and joints, and the resultant smooth fire surface, is another advantage. The fact that in a heating plant a boiler is out of service and confined in a damp cellar in the summer time affords a cast iron boiler an opportunity to show its superiority over wrought iron boilers, because cast iron is less sensitive to the process of rusting. While wrought iron will continually scale and peel off, cast iron will take on one coat of rust only and does not peel off.

The ability of cast iron to resist the influence of bad water on its interior surfaces and the effects of smoke gases on its fire surfaces is not to be forgotten.

Turning from this sketch of the material to the matter of constructions that have resulted from its use, we have the position of the different sections. We find horizontal sections with vertical connections and vertical sections with horizontal connections, and in some cases also the drop tube type. Whether the boilers are built up in the factory or sent in separate parts to the building, to be assembled there, some form of connection is necessary, either packed joint or metal connections. The metal joints are made with either smooth or threaded nipples, the latter having right and left hand threads or only right hand threads with lock nuts. The bolts used are either short ones from section to section or long ones running the whole length of the boiler.

The above mentioned constructions are all similar in that the separate sections are joined together to make up the whole boiler. Yet the claims of the several manufacturers are as many sided as the results obtained. On one point all German manufacturers seem to agree; that is, the necessity of having a fuel magazine, while the American manufacturers mostly seem to avoid it. The reason for this is that the kind of fuel used and the demands on the boiler in America do not necessitate the use of a magazine.

After the magazine, which, as stated, is an accepted necessity here, come many different theories of interior construction. The drop tube boiler has only an upper connection, while the O shaped sectional boiler has two, and as the sections become nearer square they have, according to the arrangement of the magazine, three or four connections. The bases are usually separate, in which event they form the ash pit or smoke box, and where they are cast onto the section they in some cases carry the return openings.

Many boilers are covered with a sheet iron casing which forms a jacket, the space being filled with asbestos, or felt, &c., and again forming only a dead air space, the object of which is to prevent radiation of heat in the cellar.

A particular feature of many constructions is the automatic regulator, which is in most cases a part of the boiler. This regulator not only controls the air supply to the fire, but also the damper in the smoke flue. For cast iron boilers a reliable regulator is very necessary, because of the small amount of water contained and of the more effective ararngement of the fire surfaces, which make the boiler very sensitive and cause sudden changes in pressure and temperature, all of which can be controlled with the regulator.

The use of a steam dome has come much into favor lately, for the reason that it insures dry steam and helps to better extract the heat, in that it gives a better circulation of the water.

Referring to the inner construction of the boilers, and to follow these from the grate to the smoke box, we have first the grates. Most boilers have their grates cast onto the sections, in which case water circulates through them, and, besides keeping the grate cool and preventing its burning out, adds to the fire surface and precludes the possibility of the formation of clinkers or baking onto the grate. Other boilers have under or inlaid grates, either flat or round topped. In the latter case they are shaking grates, which are supposed to grind the clinkers and drop them into the ash pit.

From the grate the fire passes either through the fuel or sideways from the fuel. Both systems are good; yet it has been demonstrated by authorities that, when using coke, where the fire passes through the fuel the results are quite as good as where it burns off to the sides, for the reason that there is more contact surface.

The heated gases are carried in many ways to their exit in the smoke flue. Generally, however, it is accepted that to carry them vertically up or down is best, as the vertical smoke flues are self cleaning, especially

*Read at the third convention of German Heating Trades at Mannheim, Germany, August 14, 1901.

where the products pass downward. In this type of boiler especial care is to be taken in proportioning the flues so as to insure an equal division of the heated gases.

Some boilers on the market are made of two patterns or sections, while others need from three to seven patterns. It might be best to choose the simpler forms, so long as they are not less effective than the more complicated constructions.

The pressure to which the various manufacturers test their boilers is from 30 to 90 pounds per square inch. A factor of safety lies in testing to the highest possible pressure.

A cast iron boiler has very little capacity for storing heat. It is possible to have 1½ pounds pressure on a steam system in 20 minutes after starting the fire, while, on the other hand, it is well known that they rapidly lose pressure, which, as mentioned above, necessitates the use of a reliable regulator.

The surplus heat in cast iron boilers must be in the large amount of fuel carried, which emphasizes the necessity for a magazine feed. As fuel, coke has proved itself to be the best for magazine fed and regulated systems, because of the small quantity of gas that it contains, which accounts for its smokeless combustion. Second in line come anthracite or bituminous coals, which contain little gas. These can be used alone or mixed with coke, and will give economical results.

Fuels giving off large quantities of gas or tar are not to be used in cast iron boilers, except where there is a large combustion chamber for the proper mixing of the gases and air to burn them, as well as proper facilities for cleaning the smoke flues. Where fuel rich in gas is used it would be best to use surface burning boilers—that is, without the magazine.

The efficiency of cast iron boilers, even in the smaller sizes, is much higher than in wrought iron, owing to the better arrangement of the flues and contact fire surfaces. The ratings shown in the catalogues and price-lists of the several manufacturers vary from 2800 to 5800 B. T. U. of heat per square foot of fire surface. One American price-list shows a rating equal to 8000 B. T. U. per square foot of fire surface.

After several defaults at the start, which were to be expected, cast iron boilers have constantly grown in favor, so that at the present time their use is very large. Confidence in them is now universal, and State and city authorities no longer offer objections to their use. The number of boilers used on a single job has also increased, so that it is not unusual to see six to eight boilers coupled together on a single system. That this arrangement of the heart of the apparatus is defensible and strengthens the reserve power needs no special mention here.

The objections offered against the use of cast iron as material for the construction of boilers are still present to some extent; that is, as far as they refer to its liability to fracture from extreme pressure or sudden change in temperature due to freezing or burning, or to its having lesser tensile strength than wrought iron. All other objections can be overcome by care in manufacture, or at least be reduced to a minimum, and I can assure you from experience that the number of defects in material discovered in cast iron boilers was in only a minute fractional per cent. of the boilers sent out.

These objections are more than offset by the many advantages offered by cast iron boilers, and I wish to close this paper by bringing these to your notice again. The ability to make the boiler in sections and to send it, either as a whole or in parts, to the building and assemble it there. This will surely commend the cast iron boilers to those who have ever had to install a heating apparatus in an old building.

The sectional boiler will supply any demand, the same as the radiator. It is built for present needs, and in the shortest possible time can be enlarged or repaired; so the manufacturer has only to carry in stock sections instead of complete boilers. Hence the consumer's risk is reduced without lengthening the time for delivery.

The cast iron boiler requires much less room, needs no brick setting, and has a higher efficiency because of the better arrangement of the fire surfaces than is possible in wrought iron boilers, with the consequent better utilization of the products of combustion.

The price of cast iron boilers is about the same as that of good wrought iron boilers. The brick setting, with all its cost and disadvantages due to cracking walls and the large amount of space required, is unnecessary with cast iron boilers.

I believe that the self evident advantages that I have shown, and to which many others could be added, should commend the use of cast iron boilers for central heating, and I hope that my hurriedly arranged short sketch will be of service to you.

The Pennington M. B. M. Boilers.

Phelps Bros., 284-286 Pearl street, New York City, are notifying their customers that they have given up the agency for the Henderson heaters, manufactured by the Prizer-Painter Stove & Heater Company, Reading, Pa., and that in the future they will be the Eastern representatives of the Pennington Foundry & Heater Company of Pennington, N. J., a new boiler and furnace foundry in which they are financially interested. The company's foundry is said to be one of the finest, most modern and complete in the United States. It is centrally located on the Central Railroad of New Jersey, one hour from New York City, which insures their patrons quick deliveries to all points.

They are now putting upon the market a perfect and up to date line of boilers and furnaces, including all the modern improvements known to the heating trade. Their furnace line includes a novelty, in that it is a complete deviation from the old style of furnaces, being constructed upon entirely different lines from any manufactured heretofore. They extend an invitation to all their patrons and the general heating trade to come and see samples of both boilers and furnaces upon their floors after January 15. Catalogues are now on the press and will be distributed by mail to the trade as soon as completed.

Sanitary Earthen Ware.

The catalogue devoted to sanitary earthen ware, which has just been issued by the Bellmark Pottery Company of Trenton, N. J., should be of exceptional value to the plumbing trade. It consists of 75 plate pages, full linen finished covers, the pages being secured by means of a silken cord, which enables additional plates to be added as new goods are brought out by the company. Each plate contains an excellent half-tone engraving of some plumbing fixture, so that a correct idea of its shape, ornamentation and construction can be secured. The text gives the code words, outside measure, list price and the finish, whether white, marbled or iron. The statement is made that, unless otherwise ordered, marbled finished goods will always be shipped. Each page bears the company's trade-mark, which is also put on their goods. It consists of a bell ready to be hung in a tower. The goods shown include plain and embossed lavatories of various styles, siphon jet and siphonic action water closets, hopper and trap, wash out and plain hopper closets. These are followed by a variety of urinals and fittings, railroad car closet fixtures, bed pans and druggists' mortars and pestles.

The new warehouse and factory plant of Cuyler & Mohler, Baltimore, Md., was recently shown by means of a half-tone engraving in the Baltimore *American*. The new building is four stories high, constructed to carry the heavy loads involved in a large stock of Plumbing and Heating Supplies. It is stated that the building is equipped with many original devices for handling the goods, as well as carrying an exhaustive stock of all of the lines which a contracting plumber and steam fitter may require.

PROGRAMME OF HEATING ENGINEERS' CONVENTION.

There is every indication that the eighth annual convention of the American Society of Heating and Ventilating Engineers, to be held in New York City next week, will be very interesting, as a perusal of the following programme will show:

TUESDAY AFTERNOON.

Regular Business.

TUESDAY EVENING.

Report of Tellers.
Reading of Paper—"Hospitals for Contagious Diseases and Their Ventilation," by Thomas Barwick (member of the society).
Discussion.
TOPICS FOR DISCUSSION:
No. 1. "The Tudor System of Steam Heating as Compared with the French System," as presented by M. Debesson in a paper read at the last annual meeting.
No. 2. "How Much Vacuum Can be Produced on a Steam Engine by Using the Exhaust Steam (through a heater) for Heating the Water of a Water Heating System Either by Gravity or by Aid of a Pumping System?"
No. 3. "What is the Relative Economy of a Hot Water Heating System Using the Exhaust Steam to Heat the Water Compared with Using the Exhaust Steam Direct in the Radiators by Aid of Some Air Extracting Apparatus?"
General Discussion.

WEDNESDAY AFTERNOON.

Reading of a preliminary report on a code for testing direct radiation heating plants. Presented by the Committee on Standards, together with a former discussion on same.
Discussion.
Reading of Paper—"The Temporary Warming of Large Hall of the Royal and Imperial Library, Vienna, Austria, for the Visit of His Imperial Highness, the Crown Prince of Germany, April 14, 1901," by Prof. Edward Meter of the Imperial Technical High School, Vienna. Translated from the German by Chas. F. Hauss (member of the society).
Discussion.
Reading of Paper—"Depreciation, Maintenance and Interest Charges," by Reginald Pelham Bolton (member of the society).
Discussion.
TOPICS FOR DISCUSSION:
No. 4. "Can a Hot Water Heating Apparatus be Improved by Using a Steam Boiler to Transmit the Heat to a Heater for the Purpose of Warming the Water to Heat the Radiators?"
No. 5. "What Advantage is There, if Any, in the Use of What is Known as the Closed Tank or Pressure System of Hot Water Heating?"
General Discussion.

WEDNESDAY EVENING.

The officers and New York members will entertain the visiting members at a dinner at the Arena, 39 West Thirty-first street, at 6.30 o'clock. The members and their guests will meet in the parlor immediately after the close of the afternoon session and proceed to the dining hall.

THURSDAY MORNING.

Reading of Paper—"An Investigation Into the Difference Between the Coefficients for the Thermal Conductivity of Building Materials Obtained by Peclet and Those Obtained by Later Experimenters," by A. B. Reck, Copenhagen, Denmark (member of the society).
Discussion.
TOPICS FOR DISCUSSION:
No. 6. "What is the Advantage (or Disadvantage) of Broad Grates with Shallow Firing Over Deep Fire Boxes and Intense Concentrated Fires on Small Grates in Hot Air Furnace Heating?"
No. 7. "What is the Advantage of Flame Heat from Active Firing of Small Quantities of Coal Over Heat Radiated from Heavy Intense Fires?"
No. 8. "The Advantage of so Constructing Hot Air Furnaces, &c., as to Take the Smoke, &c., from the Lowest Point of the Heater."
No. 9. "The Necessity for Maintaining the Proper Amount of Moisture in the Air of Artificially Heated Houses, Under the Law: 'Heated Air Demands Moisture in Proportion to Its Expansion.'"
No. 10. "The Advantage of Bringing Air Horizontally Upon the Heated Furnace (Giving Each Part of the Furnace Its Own Supply of Cold Air) as Compared with the General, almost Universal, Method of Passing a Thin Stratum of Cold Air Vertically Between a Jacket and the Furnaces."
General Discussion.

THURSDAY AFTERNOON.

Reading of Paper—"The Performance of Centrifugal Fans Under Actual Working Conditions," by H. Eisert (member of the society).
Discussion.
Reading of Papers.
Discussion.
Installation of Officers.
TOPICS FOR DISCUSSION:
No. 11. "What Can We Do to Impress Upon Owners of Buildings and Architects the Necessity of Adequate Smoke Flues for Heating Apparatus?"
No. 12. "What is the Proper Proportion of Grate Surface in a Boiler to the Radiating Surface in a Building in Low Pressure Steam and Hot Water Heating?"
Topical Discussion.
Adjournment.

ASSOCIATION NEWS.

Passaic, N. J., Master Plumbers.

The annual meeting of the Master Plumbers' Association of Passaic, N. J., was held on January 3, when the following officers were elected:

President, George S. Aldous.
Vice-President, Robert Cullen.
Secretary, Thomas R. Collins.
Treasurer, William Brooks.
Collector, N. Wentink.

Troy Master Plumbers.

The annual meeting of the Master Plumbers', Steam and Gas Fitters' Association of Troy, N. Y., and vicinity was held on January 8, when the following officers were elected:

President, Martin Mulligan.
Vice-President, Charles Wills.
Secretary, William F. Quinn.
Treasurer, William Ferguson.

These officers constitute the Board of Trustees.

Philadelphia Master Plumbers.

The annual meeting of the Master Plumbers' Association of Philadelphia, Pa., was held at the Builders' Exchange on Thursday evening, January 9, when the following officers were elected to serve for the ensuing year:

President, George F. Uber.
Vice-Presidents, A. M. Hicks, Samuel W. Barnes, John E. Eyanson, R. H. Watson and C. S. Warfield.
Secretary, W. S. Clark.
Treasurer, William Harkness.
Directors: S. Louis Barnes, E. F. Paulin, H. L. Righter, Gregor Drummond, R. J. Hoben and John V. McNally.
Sergeant-at-Arms, Elvin H. Mackay.

Kansas Master Plumbers.

The following call has been issued for the annual meeting of the Kansas State Association of Master Plumbers by Secretary A. P. Elder, Ottawa, Kan., under the date of January 10:

The Kansas Master Plumbers' Association will meet at 2 p.m. Monday, January 20, in Topeka (Sons of Herman Hall). This meeting will be one of the best we have ever held and I would urge that you attend. The Midwinter Fair commences on that date and you can secure a one-fare rate. Our association has steadily grown, until it now embraces very nearly the entire plumbing business of Kansas, and it is certainly not necessary for me to dwell upon the advantages of meeting the best posted men in our trade in friendly discussion and interchange of ideas. There are complicated

problems constantly coming up, and the easiest way to "get right" is by discussing them at our meetings. All branches of business now recognize the necessity of organization to correct the numerous abuses that beset all business ventures in this day and age. If you know of a good plumber having a regular place of business, secure his application for membership. The membership fee is $5 and the first six months' dues $3, which should accompany the application. (This will probably be raised at the next meeting.) You have no doubt had a good business in 1901, and a "day off" will do you good in many ways. The following well-known men have agreed to prepare and read papers that will unquestionably prove very interesting and profitable:

W. R. Golt, with the W. S. Dickey Clay Mfg. Company, "Modern Sewers."

John Bishop, Salina, Kan., "The Plumbing Business —Some Suggestions and Criticisms."

Carl Graeber, Lawrence, "Employer's Liability."

A new directory of recognized master plumbers will be issued February 1 by the National Association of Master Plumbers. Your dues should be paid not later than January 20 to insure your name appearing in the directory as in good standing.

Chicago Master Plumbers.

The Master Plumbers' Association of Chicago held their annual meeting on Tuesday night, January 14, and elected the following officers:

President, C. T. Byrne.

Vice-President, L. R. Bain.

Secretary, A. E. Mortimer.

Treasurer, Thomas Conlin.

Sergeant-at-Arms, J. B. Ryan.

In addition to the above the following were elected on the Board of Directors: C. M. Foskett, Frank P. Schuster, Joseph Reilly and D. J. Hickey, the retiring president.

Ex-President Hickey was presented with a valuable diamond ring by the members of the association as a token of their appreciation of his services during his term of office.

The Illinois Master Plumbers' Association will hold their annual convention next Tuesday and Wednesday, January 21 and 22, in East St. Louis, Ill.

To Defray Entertainment Expenses.

In view of the tension now existing between the manufacturers and the plumbers, the following letter soliciting the support of manufacturers in defraying entertainment expenses will be read with some interest:

MASTER PLUMBERS', STEAM AND GAS FITTERS' ASSOCIATION OF THE CITY OF ELMIRA, N. Y.

ELMIRA, N. Y., December 31, 1901.

Gentlemen: The master plumbers of the State of New York will hold their annual convention in our city during the first week in March, 1902. The local association of Elmira are doing all they can to make the same a success, and an interesting one to all visitors. We are preparing a souvenir programme, together with illustrations of many buildings and points of interest to the association. In this book we have a number of pages and desire to have you represented in same. The book will be 7 x 11 inches. We will accept anything you may offer for such a space; send us your ad. and any cut you may desire placed in same, and our association will appreciate the same. We propose to distribute a large number throughout the State. Let us hear from you at once.

Owing to the annoyance experienced in the past by the wholesale houses from the continual solicitation for contributions, purchase of tickets or advertising, the manufacturers, at a meeting held in Philadelphia, Pa., March 13, 1901, passed the following resolution:

Whereas, Members of this association have spent much money in advertising schemes, such as directories, programmes, souvenirs, pamphlets, bulletins and other publications of a purely temporary character and doubtful value; be it therefore

Resolved, That we, as members of this association, declare and agree that in future we will do no advertising in any directories, programmes, souvenirs or other publications that are distributed in whole or in part voluntarily, or which are not regularly issued, or which do not give the name and address of every resident in the city or town where published, or which do not give the name of all parties engaged in any certain particular line of business, or which are not sold to the trade, or in any pamphlets, bulletins or publications of any kind issued by any trade associations, nor any donation to the publishers or any association interested in any kind of said proscribed publications or subscribe to any entertainment, ball or picnic.

New York City Notes.

The yearly report of the Examining Board of Plumbers, as given in the *City Record*, shows that 272 applications were received and that 215 of the applicants received their certificates. Forty-four applications were rejected and 13 were pending on December 30. The average of almost one applicant for every working day shows that many men think the plumbing business is not yet played out from the masters' side.

* * *

Members of Richmond Branch are complaining of the action of the gas companies in that borough in doing gas fitting work for and soliciting trade from non-gas users. The companies are piping such houses at the rate of 75 cents a drop and are also selling them fixtures.

* * *

Manhattan is preparing to send a large delegation to attend the entertainment and reception of Brooklyn Branch.

* * *

Engel & McMahon of 28 St. Mark's place have just completed the plumbing in the New Star Theater at Lexington avenue and 107th street.

* * *

Considerable confusion is being caused by plumbers' bonds having to be filed in the various boroughs instead of at one office. Many plumbers filed their bonds with the Sewer Department, now defunct, during December, as required by law, and now find that the bonds must be transferred to their own borough.

* * *

The shop of Daniel Carroll, at 53 West Thirty-third street, was slightly damaged by fire last Monday morning.

Heating and Plumbing Notes.

THE GADSDEN PIPE WORKS of Gadsden, Ala., have let contracts for the erection of a building 125 x 200 feet, with all modern improvements, to be used for the manufacture of Pipe.

THE PITTSBURGH SEAMLESS TUBE COMPANY will shortly put in full operation the plant of the Atlantic Tube Company, Beaver Falls, Pa., which they purchased some time ago.

MARTIN FAHY, Waterbury, Conn., has been awarded the contract for plumbing the new parochial school and convent which the St. Thomas Roman Catholic Society are erecting in that city.

S. G. ADAMS, heating and plumbing contractor, 425 Main street, Hartford, Conn., who succeeded T. K. Conway a short time since, is now well established in his new quarters. Mr. Adams has had a long experience in the plumbing business, having been employed successively by the late James Ahern, Henry Leitch and Robert Garvie. His extensive acquaintance in the trade and many years' experience should assure him success in this new venture.

R. T. MARCY has sold his interest in the Marcy Mfg. Company, manufacturers of Wind Mills, Pumps, Tanks, &c., Bluffton, Ind., to E. V. Liners, who has held a position at the head of the company's sales department. Mr. Marcy is retiring from business. The Marcy Mfg. Company, who were organized about four years ago, consist of W. C. Elston of Union City; G. A. Ullman of Ashland, Ohio, and E. V. Liners, J. A. Ullman and E. L. Murray of Bluffton.

GEORGE M. COUCH, Hartford, Conn., has the contract for installing the plumbing in the new mill which is being erected in Burnside by the Taylor-Atkins Paper Company. He is also doing the metal work, &c.

W. H. KAVANAGH died at his home in Utica, N. Y., on January 5, after an illness of three months. He was born in Kilparish, County Wicklow, Ireland, April 25, 1832, and came to Utica in 1855. He learned the plumbing trade with T. J. Curley and in 1865 went into business for himself. At one time he conducted one of the largest plumbing establishments in Utica, his work extending into other States. As a young man he married Catharine Delaney of Utica, who, with four children, survives him.

WORK will shortly be begun on the extensive additions to the plant of the H. B. Smith Company at Westfield, Mass. The buildings include a foundry 212 x 80 feet, tumbling room and machine shop, all one story high, and to be constructed of brick, with gravel roofs. They will be of mill construction, with skylights, steel beams and concrete foundations, &c. The entire cost will be about $45,000.

AT the last meeting of the District Council of Plumbers of Hudson County at Council Hall, 11 Hoboken avenue, Jersey City, N. J., the following officers were elected: President, Joseph Lintner; secretary, James McArthur; treasurer, William Gallagher, and sergeant-at-arms, George King.

THE CURTISS & PIERPONT COMPANY, the well-known plumbing and heating contractors, of New Haven, Conn., have just issued a very attractive calendar for 1902.

JOHN STEPHEN SEWELL, captain of engineers, will receive sealed proposals at the United States Engineers' Office, Washington, D. C., until noon, February 3, 1902, for furnishing Ventilating Fans to be used in the new Government Printing Office.

AT a meeting of the library trustees recently held in the City Hall, Nashua, N. H., the contracts for heating and ventilating the library were let to the Merrill Company and the plumbing to C. H. Cronin, both of Boston, Mass.

A. A. MAYBACH, quartermaster, Fort Terry, N. Y., will receive sealed proposals until noon, January 28, 1902, for plumbing the frame barracks at that place.

THE AMERICAN BLOWER COMPANY of Detroit, Mich., are sending to the trade their catalogue No. 135, devoted to the A B C Hot Blast Heaters for heating and ventilating large public buildings and the drying of materials of all kinds. The catalogue presents a bird's-eye view of the company's extensive plant, which is followed by sectional views and views of partly constructed Heaters. These are accompanied by illustrations of Heaters incased, with Fans attached, and to be operated either by steam engines or electric engines. Tables accompany the Heaters giving full dimensions, size of piping and other particulars. The catalogue also presents sectional views showing the arrangement of the Fan and Heater in relation to the warm air and cold air passages and mixing chambers.

THE contract for installing a Kelsey Hot Air Heater in the new residence being erected for Lewis S. Welch on Prospect street, New Haven, Conn., has been awarded to W. A. T. Smith of that city.

LUTHER WILLIAMS has purchased a controlling interest in the East End Plumbing Company at Parkersburg, W. Va. He has been interested in the company for some time.

GEORGE CALLAHAN & Co., 218 Front street, New York, invite the steam fitting trade to submit their Steam Joint Cement to the severest practical test. They claim that this Cement will aid the steam fitter in making a perfectly tight steam joint, whether on low pressure work or high pressure work in connection with the modern high pressure power steam plants. The firm also make a Cement for plumbers' use, besides a variety of supplies for steam fitters and plumbers.

F. J. GAST, 26 Cortlandt street, New York, is sending to the trade a 24-page pamphlet devoted to Gast's Asbestos Air Cell Coverings for steam and other pipes to prevent the loss of heat. Cuts show the material arranged for application to steam pipes, hot air furnace pipes and steam boilers, and also as insulating material for indirect radiator stacks and for general sheathing purposes. The catalogue also contains a number of testimonials.

THE new calendar distributed by the Victor Heating Company, 2295 Broadway, New York, is well calculated to bring the company into memory when anything goes wrong with the heating apparatus. The president, John A. Connolly, and George O'Hanlon, secretary and treasurer, are both experienced men in steam and hot water heating in all its branches. They have made a specialty of high grade work and have also been called upon to do a great deal of custom work, such as the remodeling of unsatisfactory systems and remedying troubles with heating plants in the houses of their customers. This class of work, with numerous contracts to install new direct and indirect steam and hot water plants, has made the year just closed a good one for this enterprising and reliable house.

THE contract for plumbing the new brewery for the Weidmann Company of Allingtown, Conn., has been awarded to Chris. Herpich.

THE plumbers of Bangor Maine, are preparing to have the City Council pass an ordinance providing for the regulation of plumbing work, and the appointment of a plumbing inspector.

FRANK O. DUNN, Erie, Pa., has secured the contract for plumbing the Arcade Building, in that city.

THE CENTRAL SUPPLY ASSOCIATION will hold their regular quarterly meeting at the Hollenden Hotel, Cleveland, Ohio, on Tuesday, February 24.

CITY ENGINEER TURNER of Bay City, Mich., was reelected chairman of the Board of Plumbers' Examiners, and Dr. Gilbert was continued as secretary at the annual meeting recently held.

THE Ohio State Association of Master Plumbers will hold their annual convention in Cleveland, Ohio, on February 11 and 12.

BARNES MFG. COMPANY, manufacturers of Pumps, &c., Mansfield, Ohio, report 1901 business as the largest in their history. During the year their capacity was increased 25 per cent., and they have been running every day except holidays and shut down only three days for invoicing instead of ten days or two weeks as usual.

A CATALOGUE by Boyaird & Seyfang Mfg. Company, Bradford, Pa., considers their Boilers, Engines, Drilling and Fishing Tools, Iron Tanks, Refining Equipments and Oil and Gas Artesian Well Appliances. Their new electric drilling engine is built expressly for drilling oil, gas and artesian wells. These engines include all the essential points of a first-class engine and are superior for their strength, durability and economy of steam. The latest addition is their improved reversing lever. To this is attached a ⅜-inch pipe, which extends to within easy reach of the driller, thereby giving him instantaneous and direct control over the link valve.

A BOOKLET by the American Valve Company of Coxsackie, N. Y., describes their high grade Valves for water, steam, gas, ammonia, &c., and their improved Fire Hydrants. Their Gate Valves are so designed that the disks will seat perfectly, irrespective of expansion or contraction of the body when in service.

WE have received a pamphlet of the Tread-Kill Shaking Grate made by M. H. Treadwell & Co., 95 Liberty street, New York. This Grate is built for every size of furnace, and may be applied to every style of front. Every part of the Grate is so designed as to prevent warping, and there is no part which under the severest conditions will break or burn. The shaking movement will break clinker and clean a fire instantly from front to rear where free burning coal is used.

THE UNIVERSAL SANITARY WARE COMPANY, New Castle, Pa., will at once double their capacity, necessitating enlarged buildings and much new machinery.

THE BEST MFG. COMPANY of Pittsburgh have issued a series of tables in convenient form covering Cast Iron Flanges, Cast Iron and Steel Fittings, Cast Iron and Steel Reducing Elbows, Cast Iron and Steel T's, Pipe Bends, Climax Angle, Globe and Check Valves, Pres-

sure Reducing Valves, Centrifugal Separators, Cast Iron Fittings and Steel Fittings and Flanges.

The New Castle Stamping Company, New Castle, Pa., are proceeding rapidly with the erection of the buildings for their new plant.

The Welliver Hardware Company of Danville, Pa., who began to manufacture the Edgar Radiator last October, state that already they have done business with their Radiator in 13 States and have been encouraged by receiving duplicate orders.

A. J. Walker, Butte, Mont., bid $6800 and secured the contract for heating the Munroe Street School in that city.

Thomas McCarron has been appointed Plumbing Inspector of Minneapolis, Minn., by the Board of Health.

B. E. Sheehan of Bangor, Maine, has been granted a license to do plumbing in Oldtown, Maine.

The Magee Furnace Company, Boston, Mass., have furnished the boiler for the new steam heating apparatus in the First Presbyterian Church at Newport, R. I. It was installed by the Newport Foundry & Machine Company.

Hiram Oliver of the plumbing and steam fitting house of Oliver & Howland, 33 Taylor street, Springfield, Mass., died at his home on January 6, aged 66 years. He was born in Troy, N. Y., and went to Springfield when a boy. After he had learned the steam fitting trade he went into business with T. J. Gifford and F. H. Howland. Later he acquired Mr. Gifford's interest in the business, which was continued under the name of Oliver & Howland. He married Miss Jane Nely in 1860, who, with two daughters, survives him. Mr. Oliver was prominent in Masonic circles and a devoted church worker.

The plumbers of Marion, Ind., have petitioned the City Council for an ordinance to provide an inspector of plumbing and gas fitting in that city.

The Curtiss & Pierpont Company, New Haven, Conn., have the contract for plumbing, heating, gas fitting and tinning F. W. Benedict's new student apartment house.

J. P. Bagley, White River Junction, Vt., has the contract to install a Boynton boiler in the Dewey Hall, at Northfield, Vt.

In a suit against some master plumbers in St. Louis, Mo., asking that their association be restrained from alleged discrimination in regard to the sale of plumbing supplies, Judge Ryan dismissed the case on the ground that the plaintiffs had no interest in common and were improperly joined in the suit.

Powers & Stiles have moved their plumbing establishment to the Beadles Block on West Oklahoma avenue, Guthrie, Ok. T.

Patrick Glynn, a plumber of St. Louis, Mo., fell on the street on January 8 and died at the City Hospital without recovering consciousness. He was 55 years of age.

Seeger & Co., 79 North Clark street, Chicago, Ill., have filed an injunction in the Superior Court asking that the alleged "trust" in plumbing goods be restrained from further interference with the lawful conduct of their business. The members of the Central, Chicago and Confederated Supply Associations are named in the bill.

Thompson Bros., contractors, of Philadelphia, Pa., will install a steam heating plant in the new Fire Department station, at Fifteenth and Parrish streets, at a cost of $1250.

William McGonigal, who is well known to the heating and plumbing trade from his long connection with the Putnam Foundry Company, has gone into the heating and plumbing business, at 301 Union avenue, Mount Vernon, N. Y.

New Firms and Changes.

The Ramsden Steam Generator Company of Philadelphia filed articles of incorporation at Wilmington, Del., recently, the capital stock being $100,000.

The plumbing firm of W. P. Tarrant & Co., Saratoga, N. Y., have dissolved partnership, W. M. Ingmire, the junior partner, retiring. Mr. Tarrant will continue the business at the old location, 12 Maple avenue. Mr. Tarrant is a popular business man and a practical workman, having been associated with his father, Frederick Tarrant, who retired some time since.

The partnership existing between H. Brown of Brockville, Ontario, Canada, and James F. Read of Smith's Falls, doing business at Smith's Falls, has been dissolved. The business will be continued by Mr. Read.

F. F. Bentley of Niles, Ohio, has sold to Henry Ehlaner and G. C. Davis his entire plumbing and heating business. The new concern will be known as the Niles Plumbing & Heating Company. Mr. Ehlaner is at present located at Girard. Mr. Bentley retires from the business to take up a connection with the Ohio Galvanizing & Mfg. Company.

The Alexander A. Knapp Company have been incorporated at Dunkirk, Ind., with a capital stock of $10,000, to conduct a plumbing business. The directors are C. J. Slough, M. H. Hart and J. L. Slough.

Thomas Maddock's Sons Company of Trenton, N. J., have been incorporated with a capital stock of $600,000, to manufacture Pottery. The incorporators are Chas. S. Maddock, Archer M. Maddock and Harry S. Maddock, all of Trenton.

Harvey Gamble has opened a plumbing establishment on Third street, near the post office, Pratt City, Ala.

Production of Illuminating Gas in 1900.

The census statistics on the manufacture of gas in the United States in 1900 are given in a report just issued. The tendency toward concentration of industrial enterprises is exemplified in these figures, which show an increase as compared with 1890 of only 18 per cent. in the number of gas manufacturing establishments, while the increase in aggregate capital invested in gas making was 119 per cent. The average capital per establishment in 1900 was $646,523, as compared with $348,749 for 1890. The increase in the number of cubic feet of gas consumed was about 84 per cent. The average product per establishment rose from 49,217,670 cubic feet in 1890 to 76,503,482 cubic feet in 1900, an average increase of over 55 per cent. per establishment. The report shows a capital of over $567,000,000 invested in the manufacture of gas in 877 establishments in the United States in 1900. The annual value of the product of these concerns is returned at $75,716,693. The average price of gas obtaining throughout the United States shows a reduction from $1.42 in 1890 to $1.035 in 1900. This reduction in price caused the value of the product to show a lower rate of increase than would otherwise have been the case.

TRADE NOTES.

The Board of Health of Martin's Ferry, Ohio, is in the market for a Garbage Crematory. Manufacturers of such devices are invited to mail catalogues and quote prices to Dr. J. G. Parr, Martin's Ferry, Ohio.

The Joseph Dixon Crucible Company, Jersey City, N. J., are building a 100 x 200 foot addition to their plant.

The J. W. Paxson Company, Philadelphia, Pa., have taken over the entire business of the Mahoning Facing Mills Company, manufacturing Pipe Blacking, Car Wheel Mineral and Anthracite Facings, with mills located at Leslie Run and Lehighton, Pa., on the Lehigh River. Both mills having steam and water power will be operated, while the entire business will be transacted at the Philadelphia office of the J. W. Paxson Company.

The Tin Plate mill at Johnstown, Pa., owned by the American Tin Plate Company, is being dismantled, and the two Tin mills which it contained are being shipped to Monessen, Pa.

THE LETTER BOX.

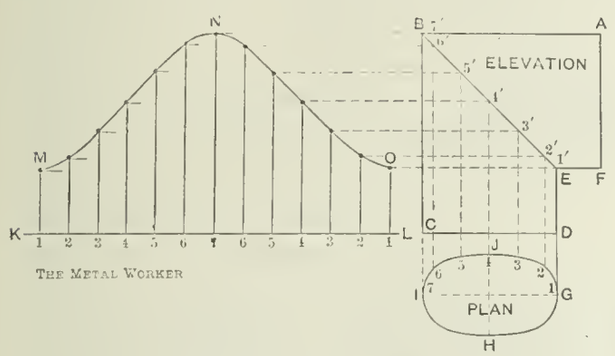
Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

PATTERN FOR OVAL ELBOW.

From N. B. H., Swampscott, Mass.—Will you kindly show me how to lay out the pattern for an oval elbow?

Answer.—In the accompanying illustration let A B C D E F be the elevation of the elbow, the plan or oval shape of which is shown by G H I J. Divide the half plan I J G into equal spaces, as shown, from which, at right angles to C D, erect lines intersecting the miter line E B at points 1′ to 7′, as shown. In line with C D



Pattern for Oval Elbow.

draw the line K L, upon which place twice the number of spaces contained in the half plan I J G, as shown by the small figures 1 to 7 to 1 on K L. At right angles to K L, and from these small figures, draw lines, as shown, which intersect with lines drawn from similar numbered intersections on the miter line B E at right angles to B C. Trace a line through the points thus obtained, as shown by 1 M N O 1, which is the desired pattern. Should an elbow be desired where the oval I J G H is in a vertical position in plan, then use the same principles as here given.

EXHAUSTIVE QUESTIONS ON HEATING.

From C. C. C., Sacketts Harbor, N. Y.—We have request for the information necessary for calculating or estimating on heating requirements, as follows:

Estimating the number of square feet of radiation required in a room or building for direct steam heating.

Estimating the number of square feet of radiation required in a room or building for indirect steam heating.

Estimating the number of square feet of radiation in a room or building for direct-indirect steam heating.

Estimating the number of square feet of radiation required in a room or building for direct hot water heating.

Estimating the number of square feet of radiation required in a room or building for indirect hot water heating.

Estimating the number of square feet of radiation in a room or building for direct-indirect hot water heating.

Estimating the size of pipe and register required for heating a room with warm air.

Estimating the size of furnace, area of cold air box, length and size of pipes and size of registers required for heating a building with warm air.

Estimating the additional requirements if the building is to be ventilated and the air to be changed any number of times per hour.

Estimating the size of ventilating shaft required, if the cubical contents of the room is known, for each specified number of times that the air is to be changed.

Note.—To adequately answer the questions presented by this correspondent would require far more space than is available in the Letter Box. Moreover, information upon most of the heads presented has been the subject of special articles in our columns within a comparatively recent period. By looking over the back numbers of *The Metal Worker* "C. C. C." will find detailed answers to all of these questions. Should he not have these back numbers to refer to, he will find it of benefit to secure some of the standard books on the heating of buildings which have been prepared by different authors.

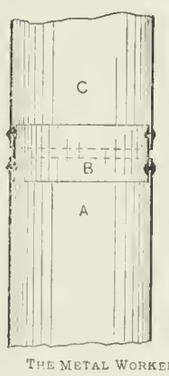
In this connection we would remind our readers of the desirability of preserving the copies of *The Metal Worker*. By consulting the files of the paper, which can be done readily with the help of the semiannual index, they will very frequently be able to secure assistance in regard to problems they may meet with in the course of their work. Should they be located near any of our branch offices, they can always find there files of *The Metal Worker* for reference.

Meantime, we shall be glad if any of our readers will lend such assistance as they can to our correspondent by giving the rules which they use on such work as is outlined in his questions. The questions presented cover a wide field and answers to them will doubtless be of as wide an interest.

SMOKE STACK PATTERNS.

From R. J. B., Mt. Vernon, Ind.—Will you please inform me how to lay out smoke stack patterns of No. 12 or 14 gauge iron, so that when all the up and down seams are all on one side the stack will be straight?

Answer.—We would suggest that our correspondent put a separate collar in each joint, as shown in the accompanying sketch, in which A shows the first joint and B the collar riveted as shown. Then C, the second joint, is slipped over the collar and riveted to same, thus making a butt joint, which insures a perfectly straight line. Another way would be to taper the joints slightly at the top to allow the following joint to slip over. In obtaining the pattern for the joints multiply the inside diameter of the pipe by 3.1416, or 3 1-7, which is generally used in practice, and add seven times the thickness of the metal in use to the stretchout of the pattern.



Smoke Stack Pattern.

PATTERN FOR ELBOWS.

From W. C., Brooklyn, N. Y.—Will you please let me know through *The Metal Worker* how to lay out elbows having any angle?

Answer.—If our correspondent will refer to problems 38, 39, 40, 41, 42, 43, 44, 45 and 47 in "The New Metal Worker Pattern Book" he will find the methods of laying out elbows of any angle very thoroughly explained; while in *The Metal Worker* of May 4, 1901, on page 46, the rule is shown for laying out any pieced elbows with the various degrees on their miter lines.

INFORMATION ABOUT A SUN MOTOR.

From the Sun Mfg. Company, Greenfield, Ohio.—We noticed in a recent issue of *The Metal Worker* an inquiry by "G. K." of Erie, Pa., for information regarding a sun motor that has been set up and run in California. We manufacture a motor for certain purposes, and would be glad to communicate with your correspondent.

POOR DRAFT IN STONE CHIMNEY.

From F. H. W., Parksville, N. Y.—I have been a reader of *The Metal Worker* for 17 years and would like to have the following letter presented in your worthy columns: I have cured many faulty chimney drafts by the use of many different chimney tops, but am now confronted with a chimney upon which I, as well as many others, have tried every scheme imaginable and have used many of the best-known chimney tops and ventilators on the market without success. The chimney is built of stone, on the outside of a church, and extends 7 feet above the building. Upon the advice of some I have extended an iron pipe through the entire length of the chimney. This proved fruitless, as did also the scheme of changing the size of the flue. The chimney is 75 feet distant from the spire and has a flue 11 x 14 inches. There is a boiler connected with the chimney



Poor Draft in Stone Chimney.

by means of a 9-inch smoke pipe. The boiler has a grate surface of 4 x 2 feet. If any of the readers of *The Metal Worker* can give me advice as to how to overcome the trouble I shall be glad to hear from them.

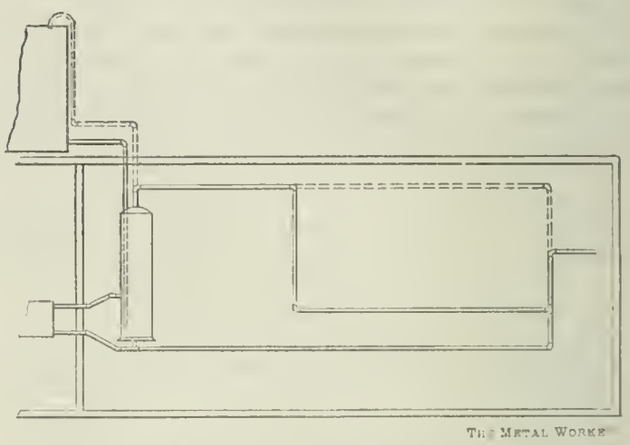
LARGER HOT AIR PIPES.

From Lennox Machine Company, Marshalltown, Iowa.—We notice the letter of "M. Y." in *The Metal Worker*, December 28, regarding size of hot air pipes. This is a matter that we have been debating in our own mind and find that there is room for argument on both sides. It is certainly true that a furnace will last better and is less likely to be overheated if the hot and cold air pipes are large, allowing a quick passage of the air over the surface. On the other hand, as somewhat of an experiment, in our own house we have been using small pipes and registers. We have but one 10-inch pipe in the house, and we find that under all conditions of the fire, any of the registers will respond quickly when opened. We think that they respond much quicker than they would if a portion of the pipes were 12 inches in diameter. We believe this is especially true in moderate weather with low fires, for where large pipes are used there is more chance for one, two or three of the pipes carrying all the air that is being warmed, and at the expense of some less favorably located register and pipe.

In regard to "M. Y.'s" inquiry as to the best location for registers in a church where but one register is used for hot air, we would think that the best place would be far enough in front to be on the lowest part of the floor. Not so much on account of making a difference where the heat comes in, but on account of being able to get short connections for the cold air registers and have them come over the low part of the floor. We think that a mistake is oftener made in the location of the cold air register faces in heating a church than in the location of the hot air register. An important thing, especially in a church furnace, is to have one of ample size, as there is a large volume of air to move and in order to move it quickly the furnace must have large capacity.

AIR BOUND; NEEDS RELIEF PIPE.

From W. W., Wyoming, Iowa.—I submit herewith a sketch of the piping to a 30-gallon boiler, which is placed in a small bathroom. Hot water can be drawn at the bib at the end of the circulating line, but as the water does not circulate, the pipe soon becomes cold. The pipe must be dropped in the corner, as shown, in



Air Bound, Needs Relief Pipe.

order to run below windows. The flow pipe is ¾ inch and the return pipe is ½ inch. I should be glad to know the cause of the trouble and how to overcome it.

Answer.—The trouble is due to the hot water pipe becoming air bound. All water contains more or less air, and, when liberated, the air will accumulate in the pipe unless some provision is made for its escape. If a small pipe is run from the highest point in the air locked pipe, as indicated by the dotted lines at the top of the boiler, and carried over to the tank, and then the end turned down over the top of the tank the air will have an opportunity to escape. The circulation will be more rapid and better if the same size of pipe is used on the return as is used in the flow, in this instance, owing to the fact that the hot water must cool and fall to secure a circulation.

PAINT FOR GALVANIZED IRON.

From New Process Mfg. Company, Dallas, Texas.—We notice in your issue of November 30, 1901, an inquiry from "B. B. C.," Temple, Texas, for a paint that will stick to galvanized iron, and would say that we have been making a paint for five years that will not scale off galvanized iron, and which is the only paint we have ever found that would not do this. We use this in painting the bells of our acetylene gas machines that work up and down in the water, and, notwithstanding being permeated with acetylene gas, the paint remains intact, so far as we have been able to ascertain. We have used it with other iron, as well as galvanized, and have failed to get it off with sulphuric, carbolic or muriatic acid. It has also stood the test of being boiled in strong brine.

PATTERN FOR ROOF FLANGE.

From J. L., New Brighton, S. I.—Will *The Metal Worker* kindly explain how to describe the pattern for a flange piece around a round pipe, passing through the center of a gable roof?

Answer.—On page 128 of "The New Metal Worker Pattern Book" Problem 36 shows the pattern which our correspondent desires. In *The Metal Worker* of August 3, 1901, on page 53, the rule for obtaining the pattern for roof flange was given, the principles of which can be applied to our correspondent's problem.

MAUPIN BROS. are carrying on the Hardware, Stove and Farm Implement business formerly conducted by C. C. Maupin, Calhoun, Mo.

TRADE REPORT.

MARKET SUMMARY.

Pig Tin is about ¾c. higher, but is quiet.

Copper has declined ¾c. further, and the market is demoralized.

Pig Lead is dull and unchanged.

Spelter continues dull, but without change.

Hallett's Antimony is a shade lower; Cookson's unchanged.

Nickel, in large lots, is lower, but retail prices are unchanged.

Aluminum is active, at former prices.

Tin Plates are quiet; jobbers' prices have weakened somewhat.

Sheets are still in large demand and market is strong.

Sheet Copper is very dull, with outlook for lower prices.

Sheet Zinc is in moderate demand; prices unchanged.

Pig Iron is very active and strong; Foundry Pig rules 50c. higher.

Scrap Iron is active and firm.

Scrap Brass and Copper are weak and lower.

Stoves in New York have been advanced 5 per cent. in price.

Soldering Coppers have been marked down 3c.

Lead Pipe is down ¼c.

Tobin Bronze Rods have been reduced in price.

Copper Wire is lower.

Wire Nails have been advanced 5c. per keg.

Cut Nails are firm and fairly active.

Copper Rivets and Burrs have been reduced 10 per cent. in price.

Cast Iron Soil Pipe and Fittings are likely to advance 5 to 10 per cent.

Plumbers' Brass Work has been reduced in price from 5 to 10 per cent.

Lead Traps and Bends have been marked down 10 per cent.

White Lead is weak and unsettled.

Linseed Oil is unchanged and quiet.

Spirits Turpentine is strong and about 2c. per gallon higher.

METAL MARKET.

NEW YORK, January 17, 1902.

Pig Tin.—Since the date of our last report, the Pig Tin market has become somewhat firmer, but it is still very quiet as far as transactions are concerned. Prices here are about ¾c. higher than those ruling a week ago. Straits Pig, in small lots, is now quoted by jobbers at 24½c. to 25c. per lb. Buying is still being done on a very limited scale, and only for immediate consumptive requirements, and speculative business is virtually absent. The market closed with a firm tone, both here and in London.

Copper.—The week under review has witnessed further reductions in the price of Copper, and consumers are not yet satisfied that the bottom has been reached. The United Metals Selling Company have decided not to announce "official" prices hereafter, and are selling at figures to meet the market. Since this announcement was made the cutting of prices has continued in a steady fashion, involving sharp declines. Wholesale business is now being done on the basis of 11c. for Lake Ingot. The amount of business, however, is very small, transactions being only of a retail character. Lake Ingot, in small lots, is now quoted by jobbers at about 11¾c. to 12c. per lb., and Casting Copper at 11¼c. to 11½c. A sharp advance in Copper in London on Thursday caused some surprise, but it was generally assumed that the rise resulted from speculative manipulation.

Sheet Copper.—But little buying of Sheet Copper is being done, notwithstanding the reduction of 3c. in price made recently. Consumers appear to be impressed with the conviction that a further cut in the price of Sheet Copper, in correspondence with the continued decline in the raw material, will be announced shortly; consequently they are buying only to the limit of their immediate requirements. The present base price of Sheet Copper is 18c. per lb.

Pig Lead.—No change is noted in this market, which is very quiet, business being on a small scale. Prices are without variation, American Pig in small lots being quoted by jobbers at 4.40c. to 4½c. per lb. St. Louis advices report some business being done in Pig Lead in that market, but the volume is not heavy. Prices show no change.

Spelter.—An easier tone was developed in this metal in the early part of the week, but the market stiffened up at the close, although business was far from brisk. Jobbers quote good Western brands in small lots at 4⅝c. to 4¾c. per lb. St. Louis advices report trade on a light order in that market and prices without quotable change.

Sheet Zinc.—The demand for Sheet Zinc is of the usual proportions. Jobbers quote 600-lb. cask lots at 6¾c. and smaller quantities at 7¼c. per lb.

Antimony.—A slight decline in Hallett's was noted this week, but not sufficient to affect the retail prices, which continue at 8¼c. to 8¾c. per lb. for Hallett's in small lots, with U. S. at the same prices and 10¼c. to 10¾c. for Cookson's.

Nickel.—No change has taken place in this metal so far as retail prices are concerned, they continuing on the basis of 60c. to 65c. per lb. It is said, however, that new contracts for large lots are being made on a materially lower basis.

Aluminum.—A continued active and steady demand for this metal is noted. Small lots of No. 1 Ingot, guaranteed 99 per cent. pure, are quoted at 37c. per lb. and 100-lb. lots at 35c.

Tin Plates.—There is no change to be noted in connection with this market. Large business is rather quiet, although the American Tin Plate Company are understood to have booked some good sized contracts for deliveries in the second half of the year. The retail trade is fairly active for the season. Jobbers' prices are said to have been cut in some directions, but they are pretty well up, as a rule, in view of the comparatively light condition of stocks available for spot delivery. American Bessemer Coke Plates, I C, 14 x 20, small lots, delivered at New York and corresponding points, rule at about $4.90 to $5.15 per box.

Sheets.—Orders for both Black and Galvanized Sheets are being received at the mills in considerable volume, and the tone of the market is strong. The mills have a great deal of work on hand and are still behind on their deliveries. It is not thought likely that prices will be any higher than they are at present, however, as so many independent mills have come into the market recently, or will be coming within a short time. These new concerns are actively seeking business, and the competition created will naturally serve to discourage any marking up of prices. The demand from small consumers in the New York territory is of good proportions and serves to pretty well absorb all the shipments that arrive from the mills. Jobbers' prices are firm and unchanged, No. 27, One Pass Cold Rolled Soft Steel Sheets in small lots being quoted at about 4c. to 4.05c., and Galvanized Sheets at 65 per cent. to 67½ per cent. off the list.

Chicago advices are as follows: Black Sheets are

not yet in oversupply. The standard mills are apparently well filled with work and the small independent mills seem to be less anxious for business, notwithstanding the fact that this is the dull season with many branches of the Sheet consuming trade. Jobbers report a fair demand from store. Small lots of No. 27 Black Sheets are quoted at 3.40c. to 3.50c. and Galvanized at 70 to 70 and 5.

St. Louis reports as follows: Activity rules in the market for Sheets and the tone is very strong and firm. Jobbers quote Stove Pipe size, No. 27, at 3.45c. to 3.50c., and Galvanized Sheets at 65 and 10 off.

Old Metals.—Scrap Iron is active and firm in price, but little is being done in Old Metals of other kinds. Scrap Brass and Copper are lower. Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper	per lb.	9½c.
Light and Tinned Copper	per lb.	7¾c.
Heavy Brass	per lb.	7¼c.
Light Brass	per lb.	5¾c.
Lead	per lb.	3⅝c.
Tea Lead	per lb.	3½c.
Zinc	per lb.	3 c.
No. 1 Pewter	per lb.	15¾c.
No. 2 Pewter	per lb.	8 c.
Tin Plate Scrap, per gross ton	to	$5.00
Wrought Iron Scrap, per gross ton	11.00 to	11.50
Heavy Cast Scrap, per gross ton	10.50 to	11.00
Stove Plate Scrap, per gross	8.00 to	8.25
Burnt Iron, per gross ton	5.50 to	5.75

THE PIG IRON MARKET.

New York.—The market is strong, but not specially active in this section. The good position of Pig Iron is encouraging the starting of additional plants. There has been considerable activity lately in Basic Pig, some of the Southern producers having sold round lots. We quote for Northern Irons: No. 1, $16.50 to $17.50; No. 2 X, $16 to $16.50; No. 2 Plain, $15.50 to $16; Tennessee and Alabama brands, No. 1 Foundry, $16.25 to $16.75; No. 2 Foundry, $15.75 to $16; No. 1 Soft, $16.25 to $16.75; No. 2 Soft, $15.75 to $16; No. 3 Foundry, $15.25 to $15.50; No. 4 Foundry, $14.75 to $15.

Chicago.—Vigorous buying is in progress. Heavy sales have been made for delivery during the last half of the year, and the local furnace companies have booked large contracts for these deliveries at advanced prices. This seems to indicate that consumers of Iron feel confident that values will not shrink to any extent this year. Some large business is under negotiation and a very heavy demand is noted for spot Iron for early delivery. Spot Iron readily brings $1 more than regular quotations on Foundry grades. The Southern furnace companies are booking a great deal of this business. The Coke situation has not yet grown much better. The output of local Iron is still greatly restricted. We quote as follows:

Lake Superior Charcoal	$19.50 to	$20.25
Local Coke Foundry, No. 1	16.50 to	17.00
Local Coke Foundry, No. 2	16.00 to	16.50
Local Coke Foundry, No. 3	15.50 to	16.00
Local Scotch, No. 1	16.50 to	17.00
Ohio Strong Softeners, No. 1	17.60 to	17.85
Southern Silvery, according to Silicon.	16.90 to	17.15
Southern Coke, No. 1	16.40 to	16.65
Southern Coke, No. 2	15.65 to	15.90
Southern Coke, No. 3	15.15 to	15.40
Southern Coke, No. 1 Soft	16.40 to	16.65
Southern Coke, No. 2 Soft	15.65 to	15.90

Philadelphia.—It is difficult to give anything like close quotations at the present time. The lowest price within a day or two for No. 2 X Foundry was $16.50, Philadelphia, and the highest is said to have been very close to $18, the latter for lots of several hundred tons each. These cases are a fair illustration of the difficulty in giving close quotations, although it is probable that $16.75 to $17.25 would be a fair average at this writing. Prices may go a little higher. Some think that $18 will be reached within 30 days, but more are of the opinion that prices are high enough, and that with a return to normal conditions in the matter of Coke and railroad facilities prices should begin to ease off a little. The Coke situation is improving and cars are less difficult to secure, but there is still a great scarcity of motive power. The indications at the present time seem to favor better conditions in this respect in the near future. Quotations cover a wide range, but for Philadelphia and nearby deliveries the following are as near as can be ascertained: No. 1 X Foundry, $18 to $18.25; No. 2 X Foundry, $16.75 to $17.25, and No. 2 Plain, $16.25 to $16.50.

Pittsburgh.—The purchase of 100,000 tons of standard Bessemer Pig Iron by the United States Steel Corporation, for delivery in April, May and June, and of 6000 tons by another Steel interest, together with heavy sales of Foundry Iron, has put the Pig Iron market on such a firm basis as insures beyond question the continuance of present conditions, at least through the first half of this year. All the Iron the furnaces can make in the first quarter is under contract, as well as a large part of the output for the second half. This probably means that furnaces will charge higher prices for small lots of Iron for prompt delivery. Sales of Northern brands of No. 2 Foundry Iron, for delivery the second half of the year, have been made on the basis of $16.50, Pittsburgh, and for prompt delivery $16.75 to $17 has been done. We quote standard Bessemer Pig Iron at $16.50 to $16.75; No. 1 Foundry, $17 to $17.50, and No. 2 Foundry at $16.50 to $17, all f.o.b. Pittsburgh.

CHICAGO REPORT.

Scrap Iron and Steel.—As the consumption is large, the movement is growing and prices are well maintained. All classes of Scrap are now in good demand. We quote dealers' buying prices for carload lots, Chicago delivery, as follows:

	Per net ton.	
Country Wrought Scrap	$11.00 to	$11.50
Machinery Cast	10.50 to	11.00
Malleable Cast	10.00 to	11.00
Stove Plate (free from burnt)	8.00 to	8.50
Burnt Iron and Grate Bars	5.50 to	6.00
Sheet Iron and Hoops	6.00 to	7.00
Plow Steel	.... to	7.00
Breaking Stock	9.00 to	10.00
No. 2, such as Shovels, Hoes, &c	.... to	7.00
Old Boilers—whole (Iron)	6.50 to	7.00
Old Boilers (Iron) cut in single Sheets and Rings	10.00 to	11.00
Old Gas Pipes and Boiler Tubes	10.50 to	11.00
Cast Borings	4.50 to	5.00
Turnings	9.50 to	10.00
Horseshoes	12.00 to	....

Old Metals.—Prices of Old Copper and Brass have been marked down another notch, to conform to the drop in Ingot Copper, and trade is very limited. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	9¼c.
Copper Bottoms	7¾c.
Copper Clips	9 c.
Red Brass	8⅞c.
Yellow Brass	7 c.
Red Brass Borings	8½c.
Yellow Brass Borings	6 c.
Light Brass	5½c.
Pipe Lead	3.65c.
Tea Lead	3.35c.
Zinc	3 c.
Tin Foil	18 c.
Pewter, No. 1	16 c.
Pewter, No. 2	14 c.

Old Rubber.—Business continues dull. Consumers are holding off and stocks are increasing. Dealers' buying prices are as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	42.50	.....
Rubber Shoes	....	6½c.
Rubber Car Springs	....	5½c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6¾c.
Black Rubber	....	4½c.
White Rubber	....	8¼c.

Rags.—Dealers quote buying prices of good Country Mixed Rags, Chicago delivery, at 75c. to 85c. per 100 lbs. in any quantity.

Anthracite Coal.—Only a moderate demand is reported, another week of mild weather prevailing in this territory. Prices are unchanged, as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis	5.75	6.00
St. Louis	6.20	6.45
Kansas City, Mo	8.25	8.50

R. A. Zoeller, Tarboro, N. C., advises us that he is adding to his retail Stove, Hardware, Tinware and House Furnishing Goods business a tinning and plumbing shop. Mr. Zoeller will be glad to receive catalogues from the manufacturers and dealers in Plumbers' and Tinners' Supplies.

THE HARDWARE TRADE.

Manufacturers in some lines report an exceptional volume of new business since the opening of the year. This is notably the ease in Wire and Wire Nails, and for some other goods there has been a very satisfactory demand. The trade in general have not, however, taken up the completion of their ordering for stock, and the volume of business accordingly has not assumed its natural dimensions. The buying for several of the season lines and for miscellaneous goods was in many cases done earlier than usual owing to the confident tone which pervaded the market during the closing months of the year, and the requirements for the early part of the present year were thus in good part sufficiently covered. Manufacturers are not unwilling thus to have an opportunity to complete their assortments and to get their warehouses at least in part filled. The general feeling is that the volume of business is going to be large, and preparations are being made by both the wholesale and retail trade to lay in a good supply of goods.

The strength in the iron market, which seems assured for some time to come, gives tone to values in the manufactured products, and indicates that with a continuance of active business prices will be generally maintained. Certain lines owing to special influences are subject to suspicion. The competition of outside manufacturers is having effect on combination prices in several lines, and it may be that there will be some irregularities in such cases. Concerning one line, in which prices are very unsatisfactory, yielding little if any profit, one of the manufacturers intimates facetiously that cost and selling price are so nearly alike that it is difficult to distinguish one from the other, and adds pathetically that unless there is some understanding between manufacturers the only hope for improved conditions is that the buyers will grow sympathetic witnessing the manufacturers' distress and insist on paying higher prices. While this is an extreme case and manufacturers generally give a much more cheerful report, there is no doubt that the margin of profit on many goods which are regarded as bringing good prices is much less than it is supposed to be. This is on account of the rise in the cost of the raw material, the difficulty of obtaining it, and especially the fact that wages are gradually creeping up. This influence has had the effect of making last year's business with some manufacturers less remunerative than it should have been in view of its volume and the generally excellent condition of the trade. This increased cost of producing goods is an important factor in the situation, and argues at least for the maintenance of values while existing conditions continue. Reports from the retail merchants, whose business is the real barometer of trade, are, on the whole, very satisfactory, and indicate a large movement of goods during the first half of the year, if not into the fall and winter months.

NOTES ON PRICES.

Cast Iron Soil Pipe and Fittings.—There is an impression in the trade which is said to be based upon authoritative grounds that Cast Iron Soil Pipe and Fittings will undergo an advance of from 5 to 10 per cent. within the next few weeks. It is not known at the present time to what degree the entire line of goods will be advanced, but there is a general opinion that Extra Heavy Pipe will almost certainly be changed. Light Pipe is also likely to undergo a change, and the trade would not be surprised if Fittings, both Standard Weight and Extra Heavy, were also advanced sympathetically. It is known in the supply trade that this change is pending, and the jobbing trade are guiding themselves accordingly. The main reason for the expected advance is that Pig Iron costs to-day $2.50 more than it did when the prices now in effect on Cast Iron Pipe and Fittings were made. The year just closed has been the most satisfactory one that the manufacturers of this class of goods have known. All of the manufacturers of Cast Iron Soil Pipe are now in the association, and so far as can be learned no new foundries are contemplated. It is believed that no difficulty whatever will be experienced in maintaining an advance in prices provided the change is not of too radical a nature.

Plumbers' Brass Work.—The Manufacturers' Association of Brass and Iron Steam, Gas and Water Work held a meeting in Pittsburgh, Pa., on Tuesday, January 14, at which a new schedule of prices was adopted. These prices show a decline of from 5 to 10 per cent., according to the nature of the goods. The new schedule of prices is said to be based on the present price of Ingot Copper, and in the ratio of 70 pounds of Copper to 30 pounds of Alloy, plus labor and profit. It is the general opinion that if this is true, and the amount of profit is not exorbitant, the move on the part of the Price Committee of the association was a wise one, and that it will give the new prices a permanency which they otherwise would not have.

Lead Traps and Bends.—Under date of January 9, 1902, the discounts on Lead Traps and Bends, Combination Ferrules, Combination Soldering Nipples, Ferrules and Bends, Nipples and Bends and Lead Drum Traps underwent a decline of 10 per cent. discount to the plumbing trade. The plumbers' price is now 60 per cent. from United States Standard price-list which was issued June 30, 1901. As this change is said to have been brought about through a quarrel among the manufacturers, it is believed that the present price is not likely to last very long. Efforts are now being made to patch up the differences, and as soon as this is settled prices are likely to revert to previous quotations.

Lead Pipe, Sheet Lead, &c.—Under date 13th inst. a reduction in the price of Sheet Lead, Lead Pipe, &c., is announced by the manufacturers. Following are the present prices, which are subject to the usual discount to the trade of 20 per cent., 1 per cent. for cash in ten days being allowed and freights equalized with nearest manufacturing point:

	Per pound.
Lead Pipe	6½c.
Sheet Lead	7¼c.
Tin Lined Lead Pipe	12½c.

Copper Rivets and Burrs.—In view of the condition of the Copper market and the development of lower prices, the trade are watching closely the market for Copper and Brass Sheets, &c., but thus far there has been no further decline in these goods. A reduction, however, of about 10 per cent. has been made in the price of Copper Rivets and Burrs, of which, it is understood, manufacturers have a large stock on hand. The manufacturers are pursuing a conservative course in announcing changes of price in Copper products, and are awaiting the developments of the market for Ingot Copper, in which a stable price will probably be developed before long. Lower prices are, however, ruling for Copper Wire, bare and insulated.

Tinware.—A good deal of interest has of late been taken by the trade in the condition of the Tinware market, in which, as a result of the good understanding between the manufacturers, it has been expected that some advance in prices would be announced during the present month. This action has not yet been taken, but it is understood that a very harmonious meeting of the leading manufacturers was held in this city during the present week, as a result of which the continuation of the association is assured. Some consideration was given to action in regard to prices, but nothing definite was accomplished in this direction. The excellent relations which at present exist between the prominent manufacturers in this line give promise of regularity in prices, thus correcting a condition of things which has often characterized the Tinware business.

Wire Picture Cord.—This is a line which must be bought carefully, in view of existing confusion in regard to list prices, the diversity of discounts which are current and the fact that there is more or less departure from standards in the matter of length and count of Wires. Thus a package marked 25 yards should contain 25 yards and should be properly numbered, when, in matter of fact, some Wire is put up short length and is marked up in number, as, for example, No. 2 is called No. 3, No. 3 is called No. 4, &c. These differences in the goods have something to do with the diversity of discounts which are prevailing.

Soldering Coppers.—The radical decline in Ingot Copper has affected the price of Soldering Coppers very materially. These goods are now being sold in small lots at 17c. to 18c. per pound, whereas they fetched from 22c. to 23c. previous to the slump in Copper.

Building Papers.—There are no changes in the market for this line of goods, prices being substantially maintained at previously published figures for Tarred Roofing, Sheathing, Slaters' Felt and Deadening Materials. Business continues good and of satisfactory volume.

Pumps.—The manufacturers regard the prices which are ruling for Pitcher Spout Pumps as being too low, in view of the condition of the iron market and the excellent demand for the goods. The matter of making an advance will probably be considered.

Tobin Bronze Rods.—Under date January 3 the Ansonia Brass & Copper Company, New York, announce the following revised net prices of Tobin Bronze Rods:

Round Rods for Studs, Bolts, Forgings, &c., Ordinary Lengths.

⅝ inch to 3 inches diameter, both inclusive, 17c. per pound net.
Less than ⅝ inch and not less than ⅜ inch diameter, 18c. per pound net.
Less than ⅜ inch and not less than ¼ inch diameter, 20c. per pound net.
Less than ¼ inch and not less than ⅛ inch diameter, 27c. per pound net.

Pump Piston Rods and Yacht Shafting.

	⅝ inch to 2½ inches diameter, both inclusive. Pound net.	Over 2½ inches and not over 5 in. diameter. Pound net.	Less than ⅝ inch and not less than ⅜ inch diameter. Pound net.
Longer than 12 inches, not longer than 120 inches..	18c.	20c.	21c.
Longer than 120 inches, not longer than 180 inches..	20c.	22c.	...
Longer than 180 inches, not longer than 216 inches..	21c.	23c.	...
Longer than 216 inches...	27c.	29c.	...

Furnace Fittings.—The S. M. Howes Company of Boston, Mass., announce under date of January 7, 1902, a reduction in the price of their Furnace Fittings to 30 per cent. discount from the list price in their catalogue, dated September 15, 1901, pages 12 to 20.

Wire Nails.—At a meeting of Wire Nail and Wire manufacturers at the Hotel Lincoln, Pittsburgh, on Tuesday, the minimum price of Wire Nails was fixed at $2 a keg in carloads, Plain Annealed Wire at $1.95 and Galvanized at $2.35 per 100 pounds. The new price of Wire Nails is an advance of $1 a ton. Contracts are being booked quite freely for deliveries during January and February, while the current demand for small lots is good for the season. With the general withdrawal of the low prices recently obtainable the market is in a decidedly better state than a week ago. Small lots from store, New York, are quoted at about $2.30 to $2.35 per keg.

Cut Nails.—The market for Cut Nails is firm, with a fairly satisfactory demand for the season. The scarcity of Steel and the low price of Wire Nails is restricting the distribution of Cut Nails. In the New York market represetatives of the mills are adhering to the price of $2.35 for Nails from store. Jobbers are asking the same price generally, but in some instances are selling 2 cents below these figures.

White Lead.—The market for White Lead in Oil is in an unsettled condition, owing to keen competition. Although quotations were lowered during the latter part of December, orders are being accepted by manufacturers, it is reported, at ¼ to ½ cent below current quotations. Retail quotations, however, remain unchanged at 6½ to 6¾ cents per pound.

Linseed Oil.—The Flaxseed market fell off sharply at the end of last week, but has moved up again slightly, and the reaction in the Seed market, together with lack of interest on the part of Oil buyers, has had a depressing effect upon Linseed Oil. Consumers' requirements appear to be fairly well covered. City Raw Oil is quoted at 62 to 63 cents in small lots. Boiled Oil is 2 cents advance on Raw.

Spirits Turpentine.—The Turpentine market has been strong, with an advancing tendency during the week. Reports from the South indicate a strong feeling of the probability of a reduced production in the coming crop. The local demand is comparatively light and the market firm. Turpentine in small lots is quoted at 41 to 41½ cents per gallon.

Ripley Hardware Company, Grafton, Ill., have issued a catalogue of 64 pages, illustrating and describing the company's line of Feed Cookers, Sprayers, Whitewashing Machines, Steel Tanks and Fancy Poultry, Cattle and Sheep Breeders' Supplies.

Rollman Mfg. Company, Mount Joy, Pa., are sending out a postal circular calling attention to the merits of their Rollman Cherry Seeder, which is referred to as a practical machine for seeding large, small or California cherries.

Charles C. Stelle, 81 Fifth avenue, Brooklyn, N. Y., has issued a circular describing Post's Improved Eureka Sap Spouts with patent air trap, of which he is manufacturer.

Soper & Reid have succeeded R. J. Soper in the Hardware, Stove, Tinware and grain and seed business in Lebo, Kan.

A. L. Tuttle, Berwick, Maine, has moved his Hardware, Stove and House Furnishing Goods business to new and more commodious quarters.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED JANUARY 17, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 87¢
100-lb lots.....₩ lb, 35¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than.....	6-in. ₩ lb.	14-in. ₩ lb.	24-in. ₩ lb.
And including.....	14-in ₩ lb.	24-in. ₩ lb.	30-in. ₩ lb.
Nos. 13 to 19.....	$0.42	$0.44	$0.47
" 20.....	.44	.46	.49
" 21 to 23	.46	.48	.51
" 24.....	.46	.50	.53
" 25.....	.47	.51	.54
" 26.....	.47	.54	.59
" 27.....	.48	.57	.63
" 28.....	.48	.57	.64
" 29.....	.49	.60	.69
" 30.....	.50	.64	.77

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb. 10¼@10¾¢
Hallett's.....₩ lb, 8¼@8¾¢
U.S.....₩ lb 8 @8½¢

Brass, Roll and Sheet..... 30%

Conductors—Corrugated.

Round or Square.—

Galvanized ½ or more, N'st'd.....70&5%
" Not Nested.....70&2½%
" Plain Round, ½ or more, Nested.....70&5%
Galvanized, Plain Round, Not Nested. 70&2½%

Spiral Riveted.

Galvanized.....40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—

See *Strainers, Conductor.*

Copper—

Lake Ingot.....11¾@12 ¢
Casting.....11¼@11½¢
Sheet and Bolt.....18¢ ₩ lb basis
Cold Rolled Sheets.....19¢ ₩ lb basis
Cold Rolled and Polished Sheets..... 20¢ basis
Planished Sheets.....21¢ basis
Bottoms, Pits and Flats....₩ lb 2½¢ basis

Eave Trough, Galvanized

Territory,	L. C. L.
Eastern	.75&10%
Central	.75&7½%
Southern	.70&12½%
S. Western	.70&10%

Carloads extra 12½%
Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Eastern List.

Tin.....30%
Galvanized.....30%
Perfect Elbows.....40%

Stove Pipe—

Four-Piece

	4	4½	5	5½	6-inch.
No. 1.	$0.80	.85	.90	1.00	1.05 per doz.
No. 2.	.65	.70	.75	.80	.85 "
No 3.	.60	.63	.65	.70	.80 "

Elbows and Shoes—

Galvanized.....60%

Gasoline—

See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, Soft Steel.	C. R., R. G. Cleaned.
Nos. 14 to 16....	₩ lb. 3.65....	3.70¢
Nos. 18 to 21....	₩ lb. 3.75....	3.80¢
Nos. 22 to 24....	₩ lb. 3.85....	3.90¢
Nos. 25 and 26...	₩ lb, 3.95....	4.00¢
No. 27	₩ lb, 4.05....	4.10¢
No. 28	₩ lb, 4.15....	4.20¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb 11@14 ¢
Do. Stained..... 6@10½¢
Patent Planished. ₩ lb A, 12¢; B, 11¢ net

Galvanized.

Nos. 10 to 16.....₩ lb, 12¢ } 65@67½% off
Nos. 17 to 21.....₩ lb, 13¢
Nos. 22 to 24.....₩ lb, 14¢
Nos. 25 to 26.....₩ lb, 15¢
No. 27.....₩ lb, 16¢
No. 28.....₩ lb, 17¢
No. 29.....₩ lb, 19¢
No. 30.....₩ lb, 21¢
86 in. 1¢ ₩ lb higher.

Lead—

American Pig.....4.45@4½¢
Bar.....5@5½¢
Pipe.....6½¢.....2½% off
Tin Lined Pipe.....12½¢.....20% off
Block Tin Pipe.....37½¢.....20% off
Sheet Lead.....7¼¢.....20% off
Old Lead in exchange, 3¼¢ ₩ lb.

Mitres, Eave Trough—

See *Eave Trough Mitres.*

Nickel—

Per lb.....60@65¢

Paints, Oils, &c.—

Leads—

Lead, American White, in Oil:
Lots of 500 lb or over.....6¼ @ 6½¢
Lots less than 500 lb.....6½ @ 6¾¢
Lead, White, in oil, 25 lb tin pails, add to keg price..... @ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price..... @ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price.. @ 1½
Lead, White, Dry in bbls.....5¾ @ 6
Lead, Red, bbls., ½ bbls. and kegs:
Lots 500 lb or over..... @ 6
Lots less than 500 lb ..... @ 6½

Oils—

Linseed, City, raw.....₩ gal.....62@63¢
Linseed, City, boiled.....64@65¢
Linseed State and West'n, raw..60@61¢

Spirits Turpentine—

In Southern bbls.....41 @41½¢
In machine bbls.....42 @42½¢

Putty—

In bulk.....$1.25
In bladders..... 2.25
In cans 12 lb to 25 lb..... 2.25
In cans 1 lb to 5 lb..... 3.25

Petroleum Products—

In Barrels (Barrel Included)

Stove Gasoline.....₩ gal. 10½@11¢
Kerosene..... ₩ gal. 12@13¢

Pipe, Drain.....40%

Pipe, Spiral—

See *Conductors.*

Registers—

List Sept. 2, 1901.

Black Japanned.....60&10@60&10&5%
White Japanned.....60&10@60&10&5%
Nickel Plated.....60&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze..... 60&10@60&10&5%
Electroplated in Brass, Bronze or Copper..... ...60&10@60&10&5%
White Porcelain.....60%
Solid Brass and Bronze Metal.....50%

Roofing Material—

1 Ply Tarred Paper. ₩ ton. $28.00@30.00
2 Ply Tarred Paper...₩ roll, 108 sq. ft. 50@55¢
3 Ply Tarred Paper..₩ roll, 108 sq. ft. 75@80¢
Slater's Felt.....roll 500 sq. ft., 50@60¢
Roofing Pitch.....₩ bbl. $2.38

Rosin—

Common and Good—Strained.

Rosin, C. & D.....₩ bbl. $1.50 @$1.55
Rosin, E. & F.....₩ bbl. 1.60 @ 1.65
Rosin, G. & H ....₩ bbl. 1.70 @ 1.75
Rosin, I. & K .....₩ bbl. 1.80 @ 2.40
Rosin, M. & N.....₩ bbl. 2.90 @ 3.50

Shoes and Elbows—

See *Elbows and Shoes.*

Slate Roofing—

f. o. b. cars, Quarry Station.

	According to size.
Pennsylvania:	
Best Bangor, ₩ sqr.	$3.25@$4.50
No. 1 Bangor Ribbon, ₩ sq	3.00@ 3.50
Pen Argyle, ₩ sqr.	3.00@ 3.75
Peach Bottom, ₩ sqr.	4.85@ 5.60
No. 1 Boys, ₩ sqr.	3.35@ 3.55
No. 1 Chapman Keystone, ₩ sqr.	8.25@ 4.25
Vermont:	
Sea Green, ₩ sqr.	$2.00@$3.15
Purple, ₩ sqr.	3.75@ 4.25
Unfading Green, ₩ sqr.	3.25@ 4.50
Red, ₩ sqr	6.50@11.00
Maine:	
Brownville, Unfading Black:	
No. 1 quality	$5.25@7.50
No. 2 quality	$4.25@6.00

Solder—

½&½ guaranteed..... 16½@17¢
No. 1.....14@15½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	Per Pound. Barrels	Smaller Q'ntities
Concentrated Flux	4c	5c
Eureka Flux:		
Triple Strength	3c	3½c
Extra Concentrated	4½c	5c
Crystal	..	7c
Gedney's Fluid	2c	2c
Lennox Fluid	2c	3c
Perfection Flux	3c	3½@4c
Yager's Salts, 1 lb. bottles	.....	each, 50¢
5 lb. bottles, per lb., 45¢		

Soldering Coppers—

Per lb..... 17@18¢

Spelter—

Western Spelter.. .....4½@4¾¢

Spiral Pipe—

See *Conductors.*

Stove Pipe Elbows—

See *Elbows, Stove Pipe.*

Stove Trucks—

See *Trucks, Stove.*

Strainers, Conductor—

Galvanized..... .....50%

Tin Pigs and Bars—

Banca, pigs, ₩ lb..... .....24½@25 ¢
Straits, pigs, ₩ lb..... 24½@25 ¢
Straits, in bars, ₩ lb..... .....25½@26 ¢

Tin Plates, American Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:

IC,	14 x 20.....	$7.50
IX,	14 x 20....	9.00
IXX,	14 x 20.....	10.25
IXXX,	14 x 20.....	11.50
IXXXX,	14 x 20.....	12.75

Melyn Grade:

IC,	14 x 20.....	7.00
IX,	14 x 20.....	8.50
IXX,	14 x 20.....	9.75
IXXX,	14 x 20.....	11.00
IXXXX	14 x 20.....	12.25

Allaway Grade:

IC,	14 x 20.....	6.50
IX,	14 x 20	7.60
IXX,	14 x 20.....	8.70
IXXX,	14 x 20.....	9.80
IXXXX,	14 x 20.	10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight } IC, 14 x 20.....$5.00@5.25
" " IX, 14 x 20.....$6.00@6.25

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates—

N. B.—The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance for 8 to 10 lb coating and $2.50 to $3 advance for 15 lb and upward.

About 40 lb coating..... $16.00@16.50
About 30 lb coating..... 15.25@15.75
About 20 lb coating..... 13.25@13.75
About 15 lb coating..... 11.25@11.75
About 8 lb coating..... .....@10.00

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $12.50
IXX, 14 x 28..(112 sheets)..... 13.50
IXX, 14 x 31..(112 sheets)..... 15.00

Troughs, Eave—

See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubes and Tubing—

Brazed Brass, List June 6, 1898 .....40%
Copper and Bronze, 3c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb. 6, 1899.
Tin.....50%
Galvanized.....50%
Fittings for do.....40%

Zinc—

600 lb casks ₩ lb.....6¾¢
Per lb.....7¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
30 gal.....70&10%
35 and 40 gal.....70%
Other sizes up to 52 gal....60@60&10%
52 gal. and above..... .....60%
Extra Heavy Boilers:
18 to 52 gal.....60%
53 gal. and above 55%

Brass Work, Plumbers'—

List of December 7, 1896.

Compression:
Basin Cocks.....60%
Bath Cocks and Double Bath Cocks.. 65%
Bibs. 65%
Bibs, Flanged.....65%
Fuller:
Bibs.....70%
Basin Cocks, Nos. 1 to 4.....70%
Bath Cocks, No. 4½.....$2.40 each net
Ground Key Work:
Finished Bibs..... .....55&5%
Rough Bibs and Stops..... 70%
Rough Stop and Stop and Waste Cocks.....70@70&5%
Rough Stop and Stop and Waste Cocks, Patented.....65@65&5%

Miscellaneous—

Basin Clamps.....60@65%
Basin Plugs.....60@65%
Chain Stays. ....60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face..₩ set	$0.95	$1.05
Ground Face ₩ set	$1.00	$1.10

Sink or Bath and Wash Tray Plugs.60@65%
Soldering Nipples.....70&5@75%
Soldering Unions.....70&5@75%
Union Elbows, Hot Water Heating.... 75@75&15%

Cocks, Valves, &c.—

Cocks—

Brass—

Air and Radiator Air .....75@75&5%
Gas Meter and Union Meter.....65@70%
Steam.....65@70%

Iron—

All Iron.....70@70&10%
Iron with Brass Plugs.....65@70%

Valves—

Brass—

Check.....65@70%
Garden Hose..... .....65&10@70%
Gate.....65@65&10%
Globe and Angle, hose outlet.65@65&10%
Globe, Angle and Cross....65&10@70&5%
Horizontal, Vertical and Angle Check... 65@65&10%
Hot Water Radiator 75%
Radiator.....70&10%
Safety.....65%
Safety, Low Pressure.....65%
Jenkins' Disc:
Cheek... .....65%
Gate.....65%
Globe, Angle and Cross.....70%
Radiator.....80%
Radiator, Corner.....75%
Safety.....65%

Iron—

Iron Body.....70@70&5%
Foot.....65@70%
Jenkins Bros.:
All Iron, except Gate.....40&5%
All Iron Gate..... .....35@40%
Iron Body, except Gate..... .....60%
Iron Body Gate..... .....50@50&5%
Swing Check..... ....50%

Earthenware—

Brown Glazed.....20%
Porcelain, List of Aug. 15, 1901: Class
Basins, Urinals and Hoppers.... } A, 30%
Closet Bowls, Sundries, Washouts and Pedestals..... } B, 40%
C, 50%

Fittings—

Brass Fittings—

Finished.....70@75%
Rough.....70@75%
Bushings.....70@75%
Nipples.....70@70&2½%
Unions, Rough and Finished....70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....65@70%
Cast Iron Bushings and Plugs.... 65@75%
Cast Iron Flanges..... 65@70%
Cast Iron Floor Flanges .....65@75%
Malleable Iron Fittings.....70@75%
" " Bushings.....70@70&10%
" " Unions.....70&10@75%
" " Unions, Flange 60&10@70%
" " Pipe Hangers, Universal 50%
Wrought Iron Nipples.....70@75%
" " Couplings... .....60@65%
" " Long Screws.....60@65%

Lavatories—

Porcelain Enameled Iron.....30@30&10%

Oakum—

Plumbers' Oakum, 50 lb. bales, ₩ lb 2½¢

Pipe—

Brass, Iron Pipe Size—

⅛	¼	⅜	¾ to 3 Inch
$0.38	.31	.29	.23 ₩ lb

Cast Iron Soil—
List Feb. 25, 1901.
2 to 6 inch inclusive.
Standard.....60@60&10%
Extra Heavy..... ...65@70%
All Fittings.....70@75%

Wrought Iron—
List Feb. 15, 1900.

	Black.	Galv.
⅛ to ⅛ inch	57%	43%
¾ to 12 inch	64%	51%

NOTE.—*Manufacturers' prices are much lower than above, but prompt shipments are not obtainable.*

Radiators—

Standard List.

Steam.....50&2½%
Hot Water..... .....50%

Sinks, Etc.—

Cast Iron—	Black.	Galv.
Sinks, Square, Half Round and Corner	60@65%	60@65%
Sink Legs, ...	60%	60@65%
Sink Backs.....	60%	60@65%
Boiler Stands, Cast Iron	60@60&10%	
Cesspools, Cast Iron	60%	

Wrought Steel Sinks—

New Era, Galv'd and Enameled. ..70&5%
New Era, Painted.....50&10%
L. & G.....50%

Traps—

Drawn Lead Traps, List June 30, 1901...60%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns, Guaranteed, 45@50%
All Special Patterns.....25%
Non-Guaranteed Brands, complete line .....45@50%
Solid Copper, list of Feb. 1, 1899....40%
Solid Porcelain—Class A, 30%: B, 40%; C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899.....45@50%

ALPHABETICAL LIST OF ADVERTISERS.

Adler, H. & Co..... 9
Æolipyle Co..... 16
American Radiator Co..... 11
American Sheet Steel Co..... 1
American Tin Plate Co..... 60
Anderson Coupling Co..... 22
Arcade Mfg. Co..... 20
Armstrong Mfg. Co..... 22
Asheville Mica Co..... 20
Asphalt Ready Roofing Co .. 61
Barstow Stove Co..... 68
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Berger Mfg. Co..... 62
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Brien Heater Co..... 17
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Clark, Quien & Morse..... 60
Clason Arch. Metal Works... 57
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Cooney & Geiger..... 57
Cooper & McKee..... 55
Cope, Geo. W 19
Cortright Metal Roofing Co... 65
Crosby Steam Gage & Valve Co..... 1
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Dangler Stove & Mfg. Co..... 7
Danzer Metal Works 64
Day Metallic Mfg. Co..... 23
Detroit Stove Works..... 9
Dighton Furnace Co..... 14
Dixon, Jos. Crucible Co..... 17
Double Truss Cornice Brake Co 64
Dowman Mfg. Co..... ... 57
Drake, W. H..... 16
Drouve, G. Co..... 57
Edwards, J. H..... 23
Edwards Mfg. Co..... 59
Eller, J. H. & Co..... 63
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Fenn, Geo. E..... 57
Floyd, Wells & Co..... 13
Follansbee Bros. Co..... 1
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Friedley & Vosnardt..... 62
Frink, I. P..... 63
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Kelsey Furnace Co..... 24
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Kewanee Boiler Co..... 14
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Lamb & Ritchie..... 23
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Lawrence-Letts Elbow Co.... 18
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Peck, Stow & Wilcox Co..... 65
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Pocock, Oliver..... 64
Poorman Mfg. Co..... 67
Presbrey Stove Lining Co..... 19
Reeves Mfg. Co..... 60
Richmond Stove Co..... 15
Ringen Stove Co..... 5
Robinson, J. M. & Co..... 67
Rutland Fire Clay Co..... 18
Salem Nail Co..... 58
Sanborn, John..... 61
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Scranton Corundum & Emery Wheel Co..... 16
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Anderson Coupling Co., Portland, Ct.

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Arcade Mfg. Co., Freeport, Ill.
Troy Nickel Works, Troy, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St. Brooklyn, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.

Pumps.
Lawless, John H., Jersey City, N. J.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.

Radiator Shields.
Twin Burner Vapor Stove Co., St. Louis, Mo.

Radiators, Hot Air.
Burton, W. J. & Co., Detroit, Mich.
Independent Register Co., Cleveland, Ohio.

Radiators, Steam and Hot Water.
American Radiator Co., Chicago, Ill.
Gurney Heater Mfg. Co., Boston, Mass.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.

Range Boilers.
Koven, L. O. & Bro., 50 Cliff St., N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

Refrigerators.
Cooper & McKee, Brooklyn, N. Y.

Registers.
Canton Steel Roofing Co., Canton, O.
Dighton Furnace Co., Taunton, Mass.
Independent Register Co., Cleveland, Ohio.
Seavey Mfg. Co., Boston, Mass.

Roofing.
Asphalt Ready Roofing Co., 136 Water St., N. Y

Roofing Cement and Paint.
Callahan, Geo. & Co., 218 Front Street, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Roofing Cork.
Stowell Mfg. Co., Jersey City, N. J.

Roofing Edger.
Danzer Metal Works, Hagerstown, Md.

Roofing and Siding, Iron and Steel, Corragated and Plain.
Berger Mfg. Co., Canton, O.
Burton, W. J. & Co., Detroit, Mich.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Co., Cleveland, O.
Gummey McFarland & Co., Phila., Pa.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Reeves Mfg. Co., Canal Dover, O.

Roofing Nails.
Salem Nail Co., 279 Pearl St., N. Y.

Roofing Slate.
Bray, J. & Co., E. Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Genuine Bangor Slate Co., Easton, Pa.
Johnson, E. J. & Co., 38 Park Row, N. Y.
O'Halloran & Jacobs, Pittsburgh, Pa.

Sap Spouts.
Millar, C. & Son Co., Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.

Screens.
Harrington & King Perforating Co., Chicago, Ill.

Shears, Sheet Metal
McSherry, Chas., Pittsburgh, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y
Keene Geo. C. & Co., Cincinnati, O.

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Niagara Machine & Tool Wks.. Buffalo, N. Y.
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Peck, Stow & Wilcox Co.. 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Pocock, O., Cincinnati, O.
Poorman Mfg. Co., Piqua, O.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Stiles & Parker Press Co., Brooklyn, N. Y.

Sheets, Galvanized.

American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
McClure & Co., Pittsburgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Alan Co., Philadelphia, Pa.

Sheets, Iron and Steel.

American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Co., Alan Philadelphia, Pa.

Shingles and Tiles, Metallic.

Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.

Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Skylights.

Canton Steel Roofing Co., Canton, O.
Drouve, G. Co., Bridgeport, Conn.

Slaters' Tools.

Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 279 Pearl St., N. Y.

Snow Guards.

Clason Arch. Metal Works, Providence, R. I.

Solder.

Bruce & Cook, 186 to 190 Water St., N Y
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

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Ostrander, W. R. & Co., 204 Fulton St., N. Y.

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Vogel, Wm. & Bros., Brooklyn, N. Y.

Steam and Gas Fitters' Supplies.

Curtis & Curtis Co., Bridgeport, Conn.
Walworth Mfg. Co., Boston, Mass.

Steam and Water Engineering and Regulating Specialties.

Kieley & Mueller, 7?11 West 13th St., N. Y.

Steel Shapes.

Cambridge Rolling Mill Co., Cambridge, Ohio.

Steel Stamps and Stencil Dies.

Schwerdtle Stamp Co., Bridgeport, Ct.

Stove Cement.

Dixon, Jos. Crucible Co., Jersey City, N. J.

Stove Linings.

Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.

Hoffman, Geo. W., Indianapolis, Ind.
Rutland Fire Clay Co., Rutland, Vt.

Stove Patterns.

Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Milwaukee Pattern Works, Milwaukee, Wis.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.
Metal Shingle & Siding Co., Ltd., Preston, Ont., Can.

Stove Repairs.

Clark, Henry N. Co., Boston, Mass.
Howes, S. M. Co., Boston, Mass.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Troy Nickel Works Troy, N. Y.

Stove Trimmings, &c.

Troy Nickel Works, Troy, N. Y.

Stove Trucks.

Arcade Mfg. Co., Freeport, Ill.
Howes, S. M. Co., Boston, Mass.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

Stoves and Ranges.

Barstow Stove Co., Providence, R. I
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Brand Stove Co., Milwaukee, Wis.
Champion Steel Range Co., Cleveland, Ohio.
Detroit Stove Works, Detroit, Mich.
Dighton Furnace Co., Taunton, Mass
Eclipse Stove Co., Mansfield, O.
Enterprise Stove Co., Vincennes, Ind.
Floyd, Wells & Co., Roversford, Pa.
Fuller & Warren Co., Troy, N. Y.
Gurney & Co., Boston, Mass.
Magee Furnace Co., Boston, Mass.
Quincy Fdry. & Novelty Co., Quincy, Ill.
Richmond Stove Co., Norwich, Conn.
Ringen Stove Co., St. Louis, Mo.
Sheppard, Isaac A. & Co., Phila., Pa.
Smith & Anthony Co., Boston, Mass.
Stamford Foundry Co., Stamford, Ct.
Twin Burner Vapor Stove Co., St. Louis, Mo.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.

Adler H. & Co., Pittsburgh, Pa.
Dangler Stove & Mfg. Co., Cleveland, Ohio.
Detroit Stove Works, Detroit, Mich.
Dighton Furnace Co., Taunton, Mass.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.

Dangler Stove & Mfg. Co., Cleveland, Ohio.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
National Vapor Stove & Mfg. Co. Lorain, O.
Ringen Stove Co., St. Louis, Mo.
Twin Burner Vapor Stove Co., St. Louis, Mo.

Street Lamps, Gasolene.

Merkel, H., St. Louis, Mo.

Tank Heaters.

American Radiator Co., Chicago, Ill.

Tanks, Steel and Wood.

Edwards, J. H., 59 Park Place, N. Y.

Terne Plates.

American Tin Plate Co., New York.
Taylor, N. & G. Co., Phila., Pa.

Tinners' Tools, Machines and Supplies.

Berger Bros. Co., Phila., Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. O. & Co., Cincinnati, O.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn N. Y.
Weiss, H. & Co., 20 Cliff St., N. Y.

Tinners' Trimmings.

Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate.

American Tin Plate Co., New York.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

Tin Scrap.

Vulcan Metal Refining Co., 157 Cedar St., N. Y.
Vulcan Western Co., Streator, Ill.

Tools and Machines, Steam and Gas Fitters'.

Armstrong Mfg. Co., Bridgeport, Conn
Curtis & Curtis Co., Bridgeport, Conn.
Saundera', D. Sons, Yonkers, N. Y.

Torches, Plumbers.

Clayton & Lambert Mfg. Co., Detroit, Mich.

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Crosby Steam Gage & Valve Co., Boston, Mass.
Jenkins Bros., 71 John St., New York.
Morgan & Co., Chicago.

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Berger Bros. Co., Phila., Pa.
Dowman Mfg. Co., Atlanta, Ga.
Fenn, Geo. E., Boston, Mass.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.

Marston, L. G. & Co., Boston, Mass.

Washing Machines.

Wayne, Anthony Mfg. Co., Ft. Wayne, Ind.

Water Coolers.

National Enameling & Stamping Co., 78 Beekman St., N. Y.

Water Closets.

Colwell Lead Co., 63 Centre St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Water Fronts.

Clark, Henry N. Co., Boston, Mass.

Water Heaters.

Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.

Miner & Peck Mfg. Co., New Haven, Ct.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Official letters of reference should not be inclosed with replies to advertisements appearing in these columns as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

SUPERINTENDENT, thoroughly capable, for iron foundry and machine shop in Germany; German-American preferred. Address confidcntially, giving references. "A. 6," care *The Metal Worker,* Chicago, Ill. Jan. 18

A man to do PLUMBING and TINNING; must be able to estimate on plumbing work. R. A. Zoeller, Tarboro, N. C. Jan. 18

Experienced FOREMAN of good mechanical ability for a nested stove pipe factory. "Manufacturer," care *The Metal Worker,* New York. Jan. 18

First-class PATTERN MAKER who understands molding and is competent to make mechanical drawings for house heating steam and hot water boilers, and to design a new boiler to put on the market. M. N. Hedges, Chattanooga, Tenn. Jan. 18

At once, two TINNERS who can also do slate roofing; none but first-class men wanted; nine hours; $2.50 per day. Smith & Manrow, Washington, Pa. Jan. 18

Young man as ASSISTANT FOREMAN in cornice shop; must have at least three years' experience, strictly temperate and a hustler; to such a man we will give yearly contract; good chance for advancement. Johnson Mfg. Company, Greensboro, N. C. Jan. 18

Several good CORNICE MAKERS for in and outside work; steady work for the right men. Johnson Mfg. Company, Greensboro, N. C. Jan. 18

A good all around man for village shop; single man preferred; temperate and industrious. Henry Ballard, Paterson, N. J. Jan. 18

Two thoroughly competent TINNERS and CORNICE MAKERS; some knowledge of slating preferred; will expect parties taking position to remain for the year; wages from $2.50 to $3 per day. "Tinner," 35 West Wheeling street, Washington, Pa. Jan. 18

Good penman with knowiedge of bookkeeping, to make himself generally useful around country plumbing shop; must be obliging and industrious; state wages desired; permanent job to right party; location, New Jersey, near New York. "Heating," care *The Metal Worker,* New York. Jan. 18

JOBBING PLUMBER who is a respectable man of good appearance, with a knowledge of first-class country work, who can close up houses in fall and open them in spring; must be a plumber with some knowiedge of heating, engines, pumps, rams, &c.; state wages for permanent job. "Good Job," care *The Metal Worker,* New York. Jan. 18

A thoroughly competent man for SUPERINTENDENT of a steel and gas range plant; must have had experience and come well recommended. "Range," care *The Metal Worker,* Hamilton Building, Pittsburgh, Pa. Jan. 18

A good TINNER and SLATER; one that understands putting up cornice work; by March 1; steady work and good wages; married man preferred, and reference required. Lentz & Norr, Piqua, Ohio. Jan. 18

A first-class RAISER on funnel and circular cornice work; one who can put his own work together ready for the building; work mostly steady the year round; $3 for eight hours' work per day. "H. S. G.," care *The Metal Worker,* New York. Jan. 18

A good inside SOLDERER to work with hand brake, Robinson, when occasion requires; good on copper work; only first-class work done. "H. S. G.," care *The Metal Worker,* New York. Jan. 18

A first-class, experienced and intelligent SALESMAN for the stove and house furnishing trade in Wisconsin and Minnesota; good proposition; all correspondence confidential. A. J. Lindemann & Hoverson Company, Milwaukee, Wis. Jan. 18

A first-class PLUMBER and STEAM FITTER; none but a good man need apply; must be strictly temperate while about his business; will pay $15 per week; steady work, nine hours per day. Charles O. Murphy, 259 Central avenue, Norwich, Conn. Jan. 18

Two first-class CORNICE MAKERS for in and outside work. Elizabeth Cornice Works, Elizabeth, N. J. Jan. 18

A first-class TINNER who can do a good job of plumbing; only first-class men need apply: a steady job to the right party. Frank R. Jarrell, Lexington, Ky. Jan. 18

Three good TINSMITHS who can do inside and outside work, such as cornice, skylight, general jobbing, roofing and whatever belongs to the tinsmiths' trade; steady work for such men; $3 a day. Osmar Poeschel, 610 Spring street, West Hoboken, N. J. Jan. 18

Experienced and competent STOVE and RANGE SALESMAN, acquainted with territory, to sell the Eclipse line in State of New York. Eclipse Stove Company, Mansfield, Ohio. Jan. 11

SITUATIONS WANTED.

By PLUMBER, TINSMITH and STEAM FITTER; also furnace work; eight years' experience at country trade; state wages. "Plumber," 129 Jefferson street, Stamford, Conn. Jan. 18

TINSMITH; ranges, furnaces, roofing; good general jobbing hand; can do gas and steam fitting; age 28; low wages for steady job; want situation in or near New York City. "Stead, 18," care *The Metal Worker,* New York City. Jan. 18

Would like to contract labor for steam, hot water and hot air heating, also plumbing, gas fitting and roofing; jobbers to furnish material; write for particulars to "B. and C.," P. O. Box 126, Rockville Center, L. I., N. Y. Jan. 18

A PLUMBER wishes work in city or country; ten years' experience; sober and steady. Thomas McSpedon, 328 East Sixtieth street, New York. Jan. 18

HARDWARE CLERK (23); six years' experience in general hardware and plumbing supplies in city store; desires change for April 1; first-class references; strictly temperate. "H. & P.," care *The Metal Worker,* New York City. Jan. 18

By young man as STEAM and HOT WATER FITTER; can also do plumbing and gas fitting; three years' experience; strictly sober. "A. H.," 213 Williams street, Clearfield, Pa. Jan. 18

By a New York licensed PLUMBER, to take charge jobbing shop; have ten years' experience in plumbing, gas fitting and steam and hot water fitting. "A. E. J.," 953 Second avenue, Brooklyn, N. Y. Jan. 18

By a young man as PATTERN FILER; have had some experience on patching and fitting; state wages. O. J. Duke, 1109 North Twenty-fifth street, Richmond, Va. Jan. 18

By a young man, strictly temperate, with five years' experience at the tinning business; would like to make a change; will go to any place; reasonable wages. "M.," care *The Metal Worker,* New York. Jan. 18

By a competent TINSMITH and SHEET IRON WORKER; 18 years' experience; three years in this country; graduated by the Tinsmith School of Aue, Saxony, Germany; wants a steady job in a good metal factory. "L. M.," 325 West Broadway, New York. Jan. 18

By thoroughly experienced and competent GALVANIZER; up to date in all branches of the business; at present employed by the Steel Trust; will be open for position after Jan. 15. "Galvanizer," care *The Metal Worker,* New York. Jan. 18

By STEAM FITTER and PLUMBER with seven years' experience; can also estimate; wish steady position with reliable concern. "E. B.," care *The Metal Worker,* New York. Jan. 18

By a young German TINNER with seven years' experience; also some experience at plumbing; sober and steady; prefer the State of California or Colorado. "M. F.," care *The Metal Worker,* New York. Jan. 18

By a first-class SALESMAN, with some good hardware, tinware, stove or house furnishing house; have had wholesale and retail experience; can speak German and English; New York State or Connecticut preferred. F. J. Hengstebeck, 2840 Third avenue, New York. Jan. 18

By an American to represent some reliable heater manufacturing company, stove concern or plumbing, steam and general tool supplies in any part of the United States; no experience, but have traveled through several States; married man, strictly sober; wages no great object to start. "Willing," care *The Metal Worker,* New York. Jan. 18

By a TINNER and CORNICEMAN, with knowledge of plumbing and pump work; first-class on furnace work; good mechanic; reliable young man; strictly temperate; Swedish; state wages you pay in first letter. John S. Nelson, General Delivery, St. Paul, Minn. Jan. 18

Competent SALESMAN wants position east of Mississippi River; eight years' experience; good address. "Eastern Salesman," care *The Metal Worker,* New York. Jan. 18

TRAVELING SALESMAN or office man, 35, thoroughly conversant with brass and copper business (sheet, rod, tube and wire), desires position. "Metals," care *The Metal Worker,* New York. Jan. 18

BOOKKEEPER, age 30, single, thoroughly experienced in manufacturing line; up to date methods; all around man; can install good cost system; capable of taking charge of office; exceptional references; salary required, $20 per week. "W. S.," care *The Metal Worker,* New York. Jan. 18

Young man with best of references as to ability and trustworthiness desires responsible position with a progressive stove manufacturing concern or general foundry where there is an opportunity for advancement; has had ten years' experience in this line. "Canadian," care *The Metal Worker,* New York. Jan. 18

PLUMBER; young man would like work; ten years' experience. Patrick Magner, 260 East Seventy-eighth street, New York. Jan. 18

By a first-class, all around mechanic, capable of taking charge; 20 years' practical shop experience at metal patterns, dies, tools, jigs, models and experimental work, &c.; can design novelties and labor saving machinery for all purposes; location no object. "W. W. W.," 1874 Elston avenue, Chicago, Ill. Jan. 18

By a first-class PLUMBER and GAS FITTER, with knowledge of hot water and steam; experienced on Durham system and general plumbing; 10 years' experience; steady and reliable; moderate wages for steady work; references. J. Gleason, 3513 Market street, Philadelphia, Pa. Jan. 18

By an experienced STOVE PATTERN CARVER and DESIGNER of well-known ability; a permanent position; unexceptional references. "Pattern Carver," care *The Metal Worker,* New York. Jan. 18

By a first-class CORNICE and SKYLIGHT MAKER; understand circle and raised work, also drawing in all branches; best of references. "Skylight," care *The Metal Worker,* 70 Kilby street, Boston, Mass. Jan. 18

By a first-class PLUMBER and TINNER with some knowledge of steam fitting; 12 years' experience, city and country; have license for Massachusetts. Henry Young, North Adams, Mass. Jan. 18

By all around TINSMITH; 25 years old and married; want steady work. Claude McColl, 147 South Broadway, New Philadelphia, Ohio. Jan. 18

Expert NICKEL PLATER and POLISHER; steady, temperate, rapid workman; use money saving methods of my own invention; can manage help to advantage; desire steady position; references; salary reasonable. "E. H.," 9 Silver street, Dover, N. H. Jan. 18

By a steel range mechanic as FOREMAN or SUPERINTENDENT; 12 years' experience with some of the best stove manufacturers; experienced in handling help and any branch of the business; posted on estimating, cost, &c. Box 5, care *The Metal Worker,* 1205 Fisher Building, Chicago, Ill. Jan. 18

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By COPPER, TIN and SHEET IRON WORKER: honest and reliable; with 17 years' experience at general job work. "G. A. H.," 3726 Iowa avenue, St. Louis, Mo. Jan. 18

PLUMBER'S ESTIMATOR; thoroughly competent on plans and specifications (understands the Durham systems); up to date work, city or country; practical mechanic; superintending work, able to take full charge of a shop and men; permanent position asked for in a first-class establishment, none others need apply; New York City and vicinity. "Glade," care *The Metal Worker,* New York. Jan. 18

By first-class PLUMBER and GAS FITTER; eight years' experience; also good at roofing, spouting and general job work. W. P. McGimpsey, Waterford, Ohio. Jan. 18

As SALESMAN in any line of metal work; good address, tact and energy, thorough knowledge of manufacturing; small experience on road; first-class references from reliable firm. "Salem," care *The Metal Worker,* 117-119 South Fourth street, Philadelphia, Pa. Jan. 11

First-class mechanic, understanding various branches of metal trade, as FOREMAN or SUPERINTENDENT; experienced in handling men; best of references as to character and ability; especially qualified in manufacturing of hardware and kindred lines; 32 years old. "Qualified," care *The Metal Worker,* 117-119 South Fourth street, Philadelphia, Pa. Jan. 11

To The Trade:

On Aug. 3, 1901, the factory of George R. Moon, manufacturer of Moon's Ovens, at Columbus, Ohio, was destroyed by fire.

For years the "Moon" vapor ovens have borne the reputation of being the very best on the market and we take great pleasure in advising the trade that we have secured exclusive control of Mr. Moon's patents and have begun extensive preparations for the manufacture of these ovens in large quantities, and shall use our best efforts to maintain their excellent reputation.

We expect to be able to make shipment in ample time for the spring trade and respectfully solicit your patronage. Very truly yours,

THE WONDER MFG. CO.,
Washington C. H., O.

HARDWARE STOCK,

in live town in Middle West, about $2,000. Would consider taking active partner. Have business ability. Am tinner and up-to-date in heating work. Give particulars. Address "BOX 3," Care *The Metal Worker*, 1205 Fisher Building, Chicago

HELP WANTED.

Superintendent thoroughly capable for iron foundry and machine shop in Germany. German-American preferred. Address confidentially, giving references,

"A 6,"

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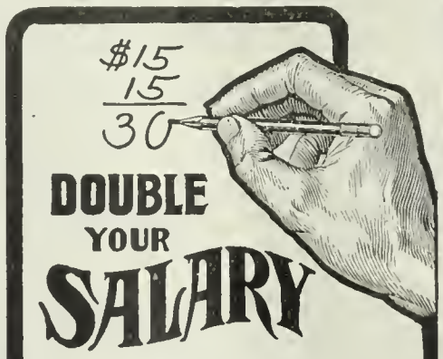
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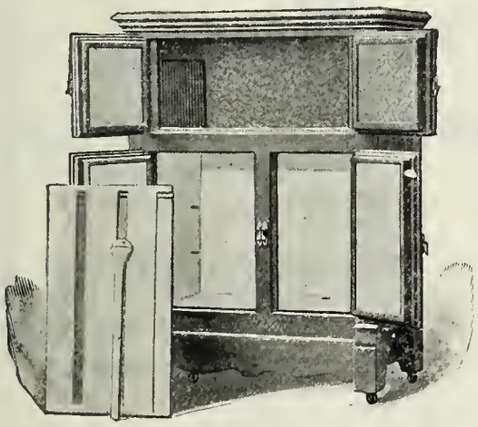
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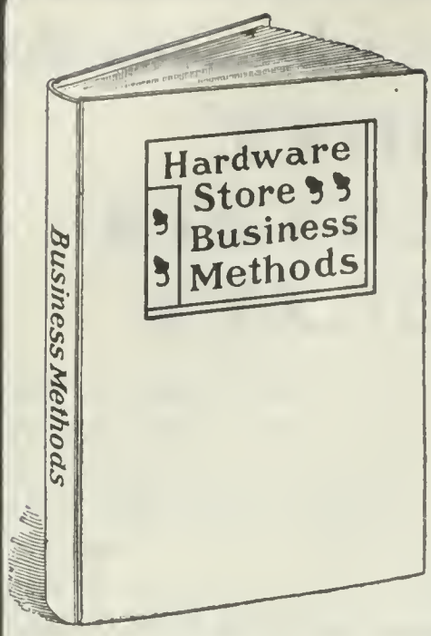
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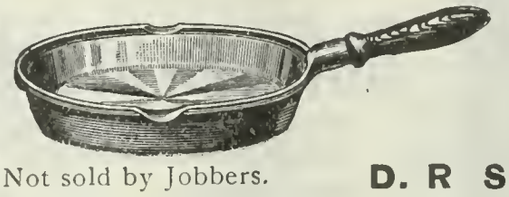
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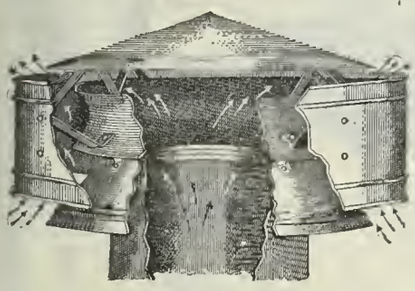
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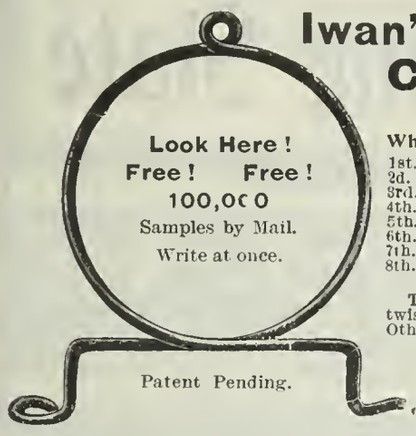
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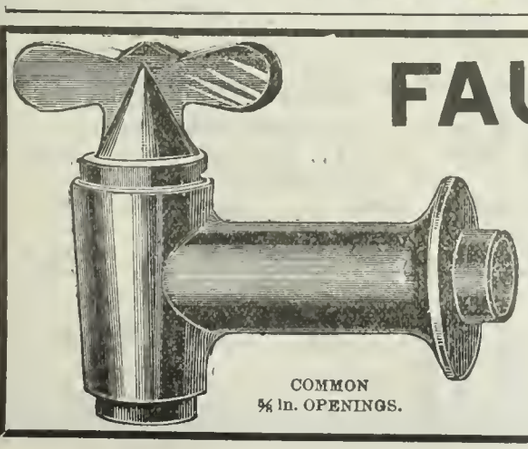
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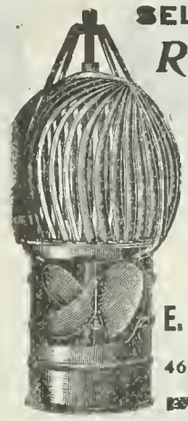
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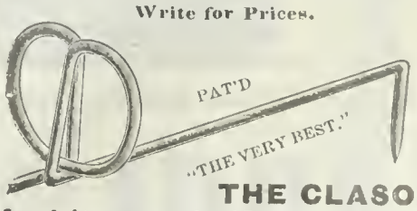
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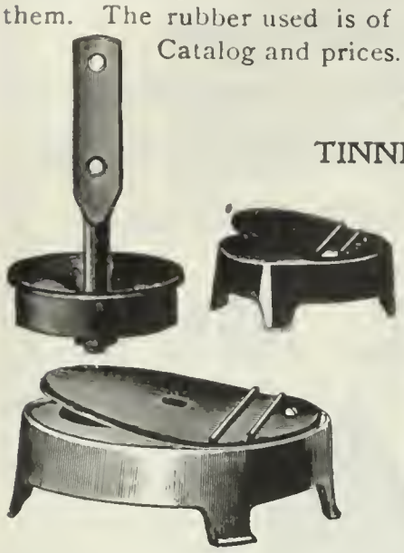
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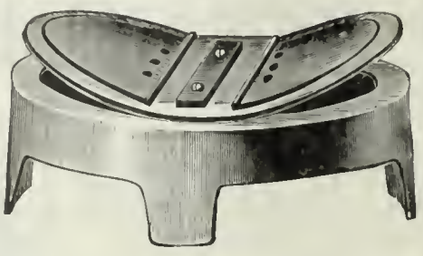


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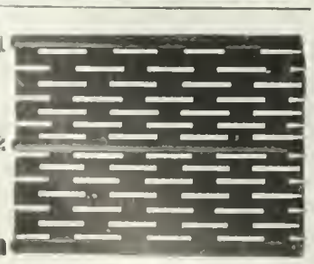
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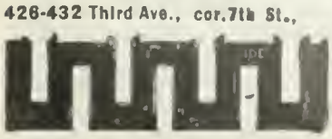
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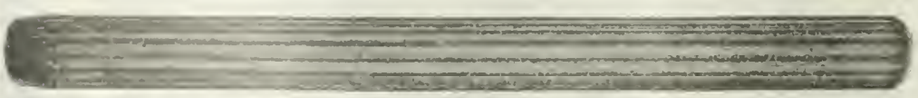


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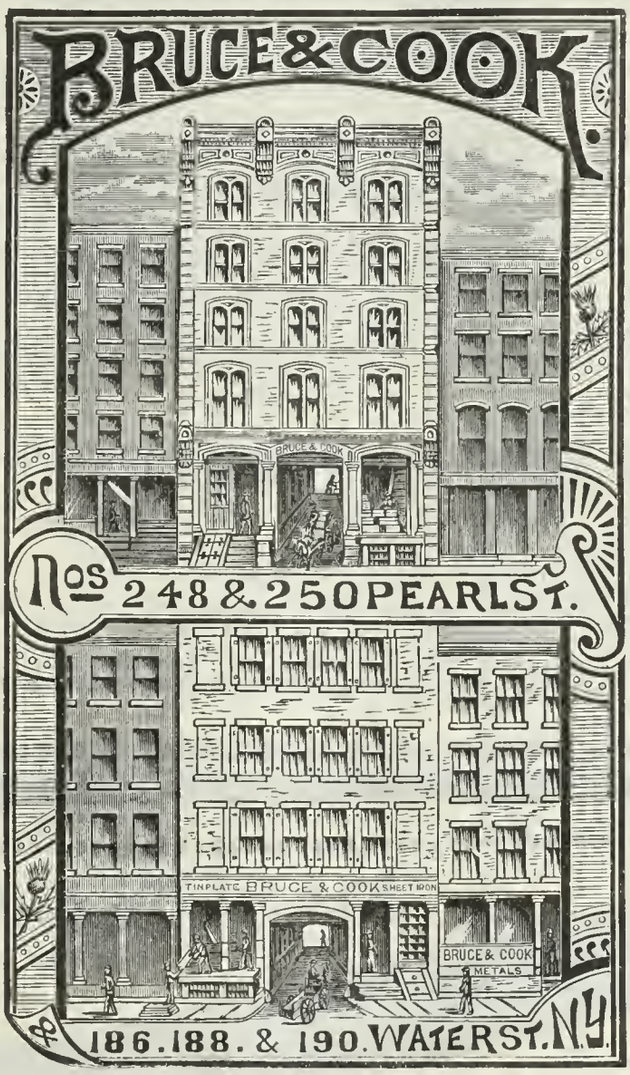
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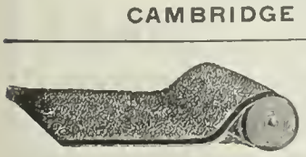
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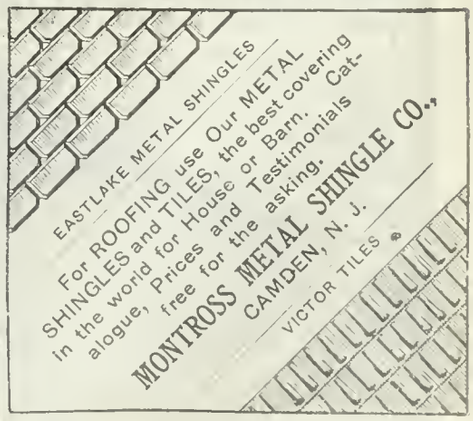
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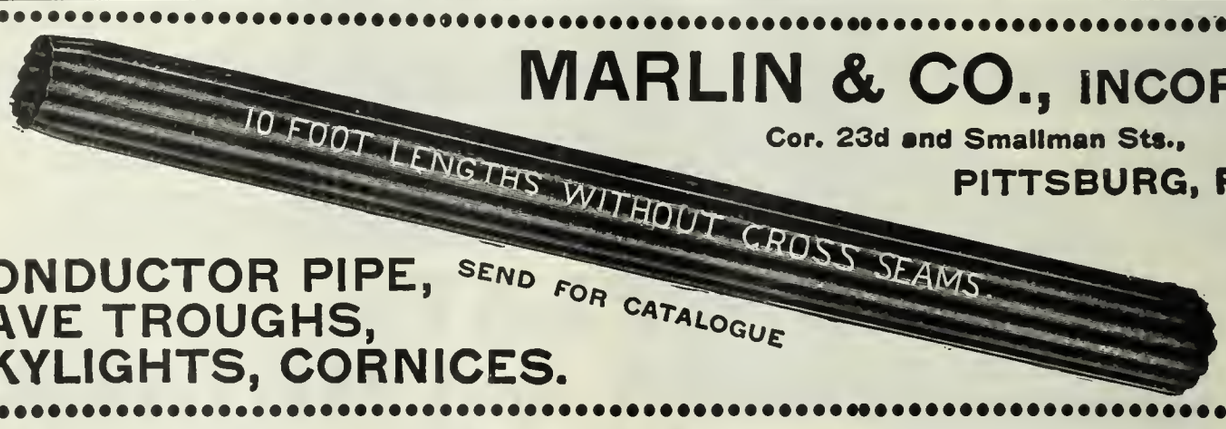


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SUMMARY OF CONTENTS.

I. Terms and Definitions—15 pages.
II. Drawing Instruments and Materials—13 pages.
III. Linear Drawing—6 pages.
IV. Geometrical Problems—35 pages.
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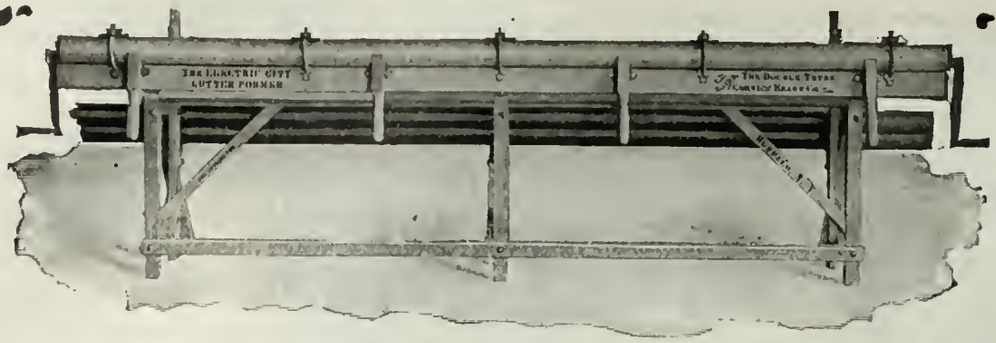
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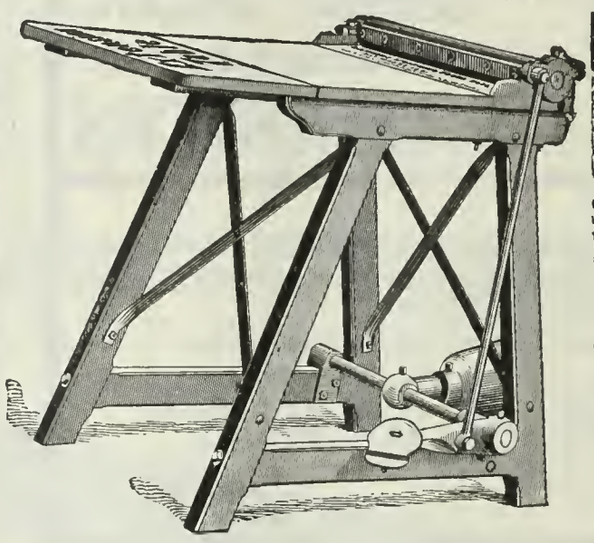
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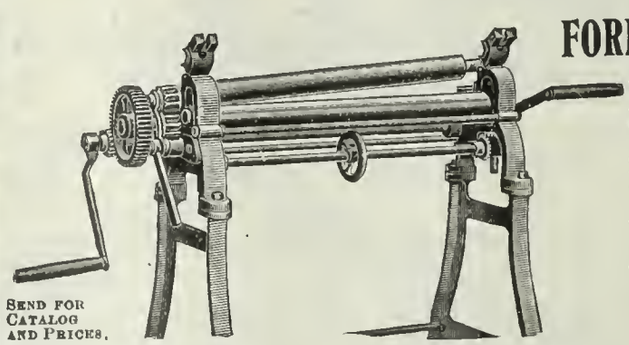
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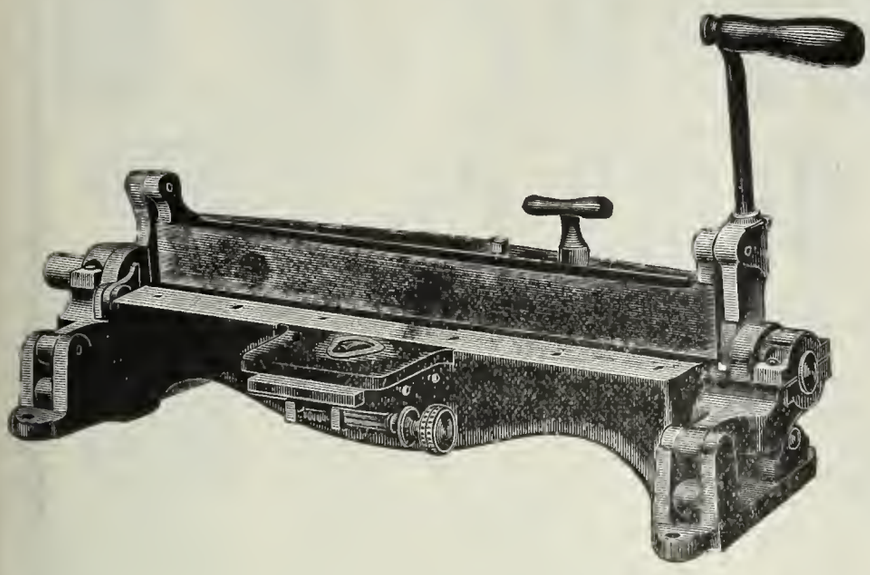
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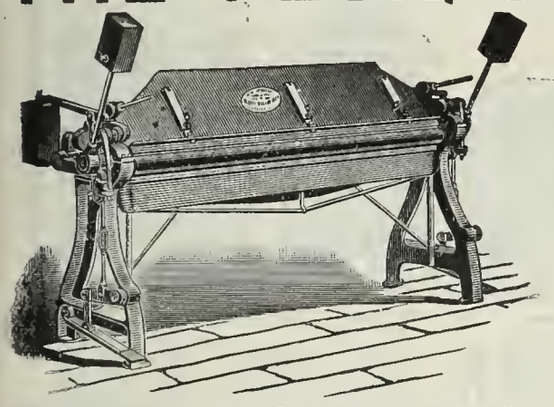
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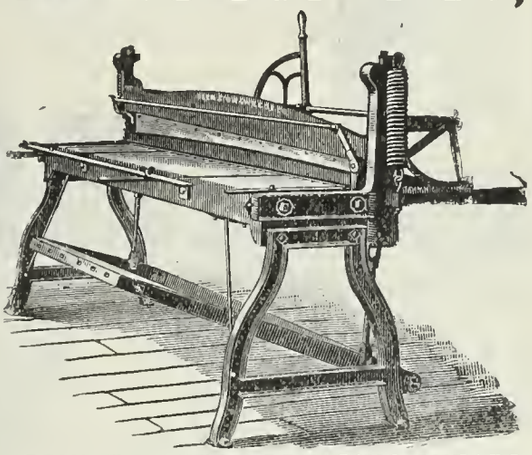
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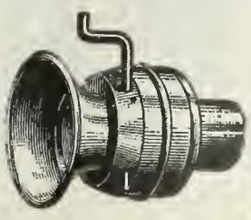
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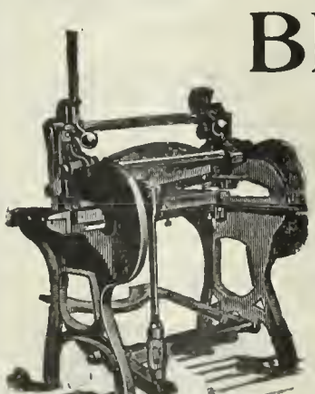
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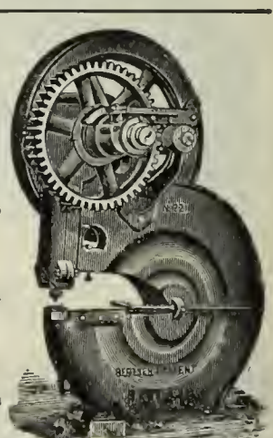
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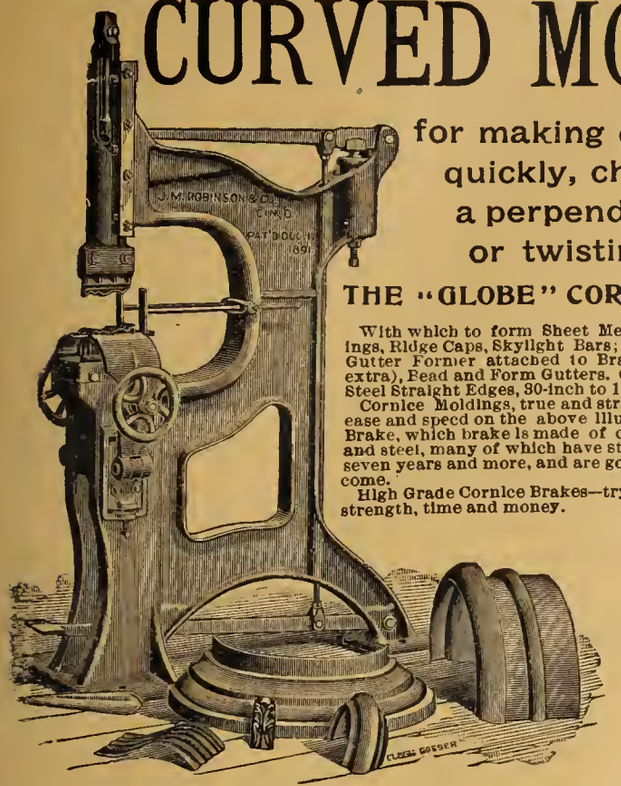
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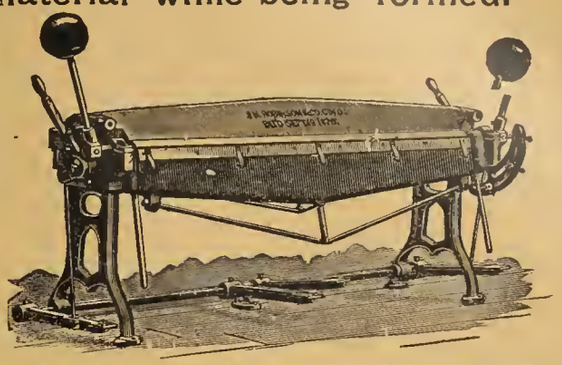
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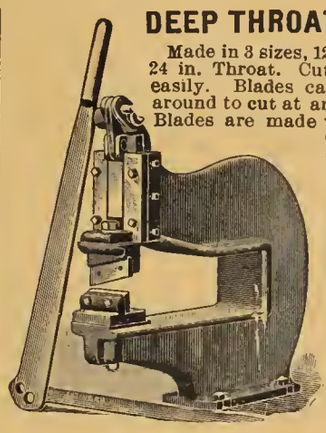
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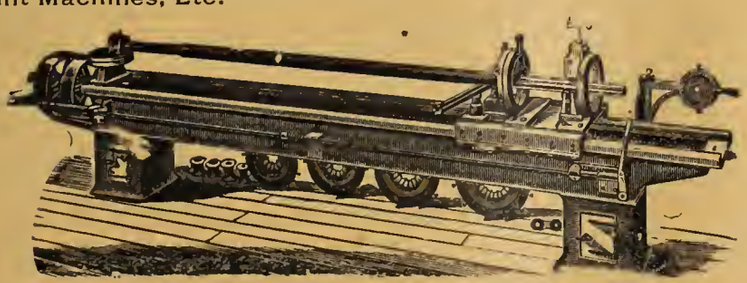
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THE POORMAN MANUFACTURING CO., Piqua, Ohio.

Latest and Most Perfect Machinery on the Market for Manufacturing

CONDUCTOR PIPE AND EAVES TROUGH, Corrugating Machinery, Power Squaring Shears, 36 inches to 11 feet; Beading Machines, Forming Rolls, Curving Rolls, Crimping Rolls, Grooving Machines, Tinners' Squaring Shears, Power Cornice Presses, Improved Metal Roofing Machinery, Paint Machines, Etc.



Latest Improved 10-foot Plain Round, Round Corrugated and Square Corrugated Conductor Pipe Machine.

IT WILL PAY YOU TO GET OUR PRICES ON ABOVE MACHINERY

TINNERS' TOOLS, MACHINES and SUPPLIES. Plumbers' Tools, Tinners' Hdwe., Soldering Flux, Salts, Coppers, Rosin, Roofing Cement, Rivets, Bolts Screws, Slaters' Tools, Second-hand Machinery and **SKYLIGHT GEARING.**

H. WEISS & CO., 20 Cliff St., N. Y.

— SAVING SOMETHING.—"You've got your overcoat on a trifle early, Hopkins."

"Yes; but my folks are interested in a rummage sale, and when I carry my clothes about with me I know where they are."—*Pearson's Weekly.*

— INDEFINITE INVITATION. — Borem: "Your face looks familiar. Haven't I seen you somewhere?"

Gorem: "Very likely; that's where I live. If you ever happen to be in that part of the country again drop in and see me."—*Chicago News.*

— BRIGHT LITTLE SAMMY.—Sammy (who is never allowed to stay out of school): "Howdie Hurlbut didn't come to school all day."

Mama: "Why, not Sammy?"

Sammy: "'Cause his mother died. When you die may I stay home all day?"

Mama: "Yes, darling; you may stay out a whole week."

Sammy (suspiciously): "Oh, I know; you mean to die in vacation."—*Harlem Life.*

GRASP TIME



By the forelock and secure the agency for the **New Model Grand** before your competitor gets it. It is as great a bread **winner** as it is a bread baker.

BARSTOW STOVE COMPANY,

BOSTON, 55 Portland St.
PROVIDENCE, R. I.
NEW YORK, Beekman and Water Sts.

LIGHTED BY FRINK REFLECTORS.

THE ART INSTITUTE
Of Chicago.

I. P. FRINK, 551 Pearl St., New York.

L. & R. WISTER & CO.,

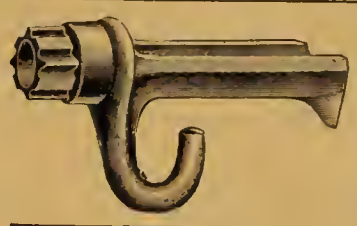
Bullitt Building, Philadelphia.

Dunbar Foundry Pig Iron.
Dunbar Connellsville Coke for Foundry Use.
American Sheet Iron Co.'s Sheet Iron.
American R. G., cleaned, of uniform black color.
Dealers in all kinds of Iron and Steel Scrap.

BRUCE & COO

TINNERS'
TOOLS and MACHINES
TINNERS'
SUPPLIES

186, 188 & 190 Water Street,
248 & 250 Pearl Street,
NEW YORK.



Ideal Sap Spou

Are made open or closed, and a full line of other Maple Sugar goods. Send for dealers' price list.

CHARLES MILLAR & SON CO , Utica, N.

HUB RANGES.



HUB RANGES sell quickly because they contain so many exclusive selling features, so sensible and self evident.

HUB RANGES are used and endorsed by all the leading Cooking Schools in New England and New York.

SMITH & ANTHONY CO., - Boston.

Send for Catalogue of Hub Water and Steam Heaters.

FINE BRANDS OF

BRIGHT CHARCOAL FINISH

TIN PLATES.

"Brilliant,"
Tissue Paper Packed.

"Royal,"
Tissue Paper Packed.

"Merion,"
Tissue Paper Packed.

"Linden."

A FULL LINE OF COKE FINISHED PLATES.

N. & G. TAYLOR CO.,

Manufacturers,
PHILADELPHIA.

The Man Who Sells

Glenwoods knows nothing of the trials and tribulations of the dealer who sells goods that are shoddy. Glenwood Ranges and Heaters are **made right, fitted right** and **shipped right**; and that means its easy to reckon profits. If you want to do a clean, satisfactory, profitable business — sell

GLENWOODS.

Write the Weir Stove Co., Taunton, Mass.

We Solicit Your Inquiries for

BRIGHT and TERNE PLATE

McCLURE & CO.,

Manufacturers of Tin Plate.

PITTSBURG, PA.,
211, 213 and 215 Second Ave.

PHILADELPHIA, PA.,
115 North 7th Street.

Index to Reading Matter, Page 54. Index to Advertisements, Pages 56 - 58.

The Metal Worker

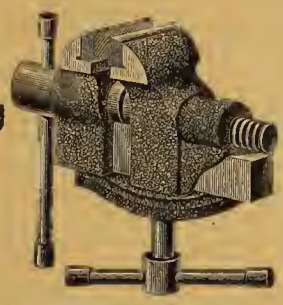
A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. LVII. NUMBER 4. NEW YORK AND CHICAGO, JANUARY 25, 1902. ONE DOLLAR A YEAR. SINGLE COPIES 5 CENTS.

WALWORTH MFG CO. TOOLS and SUPPLIES for STEAM WATER and GAS USERS BOSTON MASS

WALWORTH HEAVY PIPE VISE.



A first-class Tool for General Machine Work. Takes to 6-inch.

BOSTON, 128 Federal Street.
NEW YORK, Park Row Building.



The Gorton Side Feed Boilers

FOR STEAM AND HOT WATER HEATING.

INVESTIGATE FOR YOURSELF.

Send for Catalogue and Prices.

GORTON & LIDGERWOOD CO.,

96 Liberty St., NEW YORK. Old Colony Bldg., CHICAGO.
77 Oliver St., BOSTON. Prudential Bldg., ATLANTA, GA.



STOVE LININGS

McLEOD & HENRY CO.,
TROY, N. Y.

Our Latest Book

The Roofing, Cornice and Skylight Manual describes how to lay flat and standing seam roofing, cornice shop practice, including cornice making, and the design and construction of skylights. $1.50 Postpaid.

DAVID WILLIAMS CO., 232-238 William St., N. Y.

"The Excelsior Range is the range I always advise when I have opportunity. I used one in my own house for a quarter of a century, and I do not think there is any better."

That's the opinion of a Philadelphian and there are a great many thousands like him. Why not handle a range that brings in such testimonials?

ISAAC A. SHEPPARD & CO.

NEW YORK PHILADELPHIA BALTIMORE

It costs as much to make up cotton as linen, woddy as wool; it costs a lot more to work poor galvanized iron.

American Sheet Steel Company
New York

A. P. P. STEWART

Oak is a thing of Beauty and a joy forever.
It sells in half the time it takes to sell others.
Therefore you sell more

FULLER & WARREN CO., Troy, N. Y.

This Ad. changes every week.

NOTICE.

Silver, Nickel Platers and Brass Goods Mfrs. MATERIAL FOR DRYING PURPOSES.

Write for prices to John Sommer's Son, 355-365 Central Ave., Newark, N. J.



CROSBY SPRING-SEAT

CLOBE and ANGLE VALVES, IRON and BRASS.

All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.

Crosby Steam Gage & Valve Co.,

BOSTON: 95 Oliver St. NEW YORK: 78 John St. CHICAGO: 21 23 W. Lake St.



FOLLANSBEE BROTHERS CO.,
328-330-332 Second Ave.,
Pittsburgh.
Galvanized and Black Sheets.

Manufacturers
Roofing Tin Plates.

Eave Trough and Conductor
Sheet Copper,
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Solder, etc., etc.

Philadelphia, 133 Arch St.
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Steam Specialties.

RELIEF and NOISELESS BACK
LEVATOR VALVES, PRESSURE VALVES,
TEAM TRAPS, PUMP GOVERNORS.
TEAM AND WATER STEAM and OIL SEP-
EDUCING VALVES, ARATORS.
ANK TEMPERATURE CONTROLLER and
A No. 1 DAMPER REGULATORS
KIELEY AND MUELLER,
-17 W. 13th St., - NEW YORK.



Jenkins Bros.' Valves

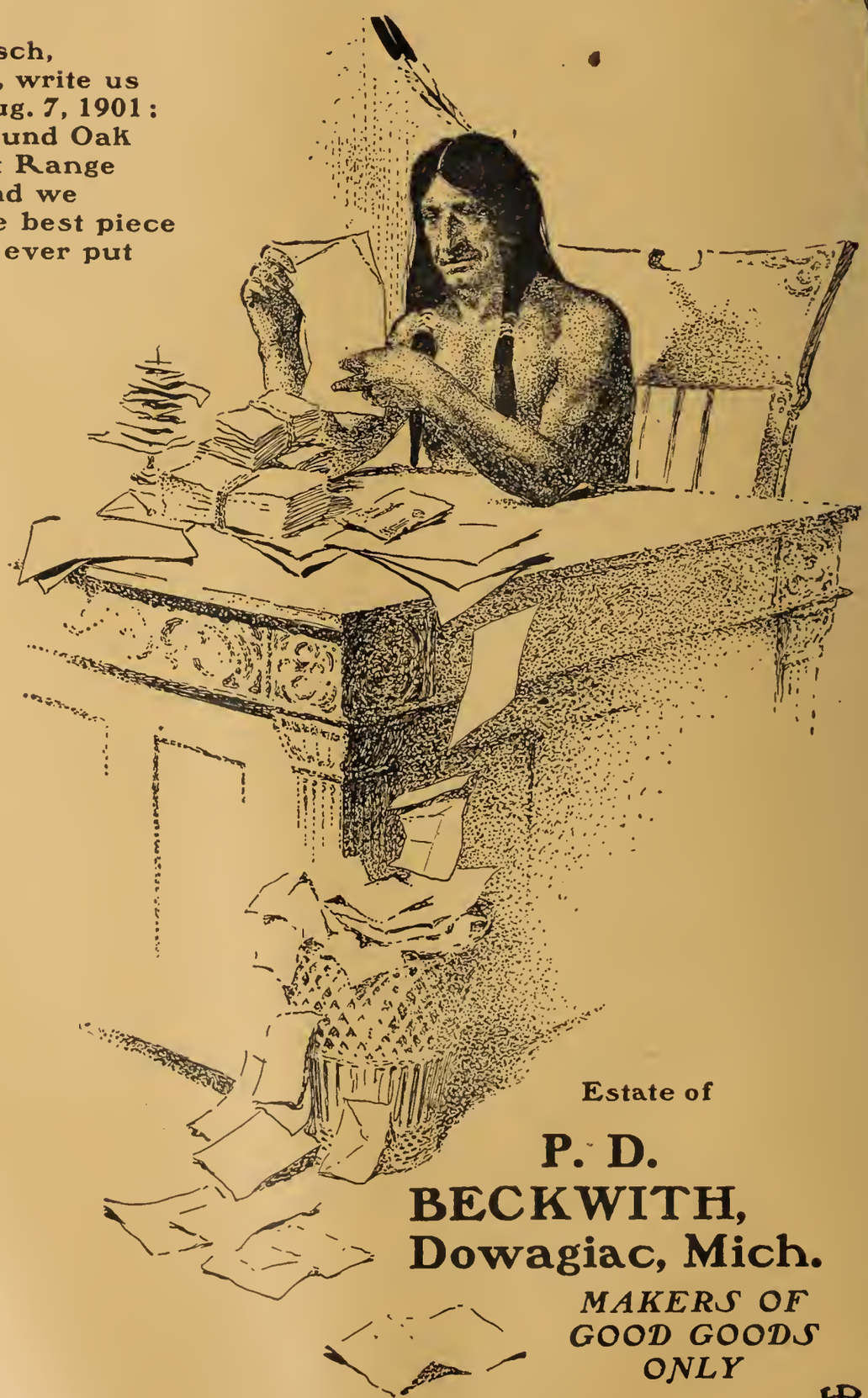
are manufactured of the best steam metal, and are fully guaranteed. Why experiment with cheap valves? If you want the *BEST* ask your dealer for valves manufactured by Jenkins Brothers. Remember all genuine are stamped with Trade Mark like cut.

JENKINS BROTHERS, New York, Philadelphia, Chicago, Boston.



ROUND OAK
STANDARD OF AMERICA

Haas & Huebsch, LeMars, Iowa, write us under date Aug. 7, 1901: "The new Round Oak Standard Cast Range is received, and we consider it the best piece of cast goods ever put on our floor." We know, of course, that the testimonial business has been worked overtime, but Mr. Haas wrote this of his own volition and he meant what he said. We believe that every stove merchant who likes to sell good goods, something a little better than the usual, would, after examining the Standard, say the same as Mr. Haas



Estate of

P. D. BECKWITH,
Dowagiac, Mich.

MAKERS OF GOOD GOODS ONLY

HB CHICAGO

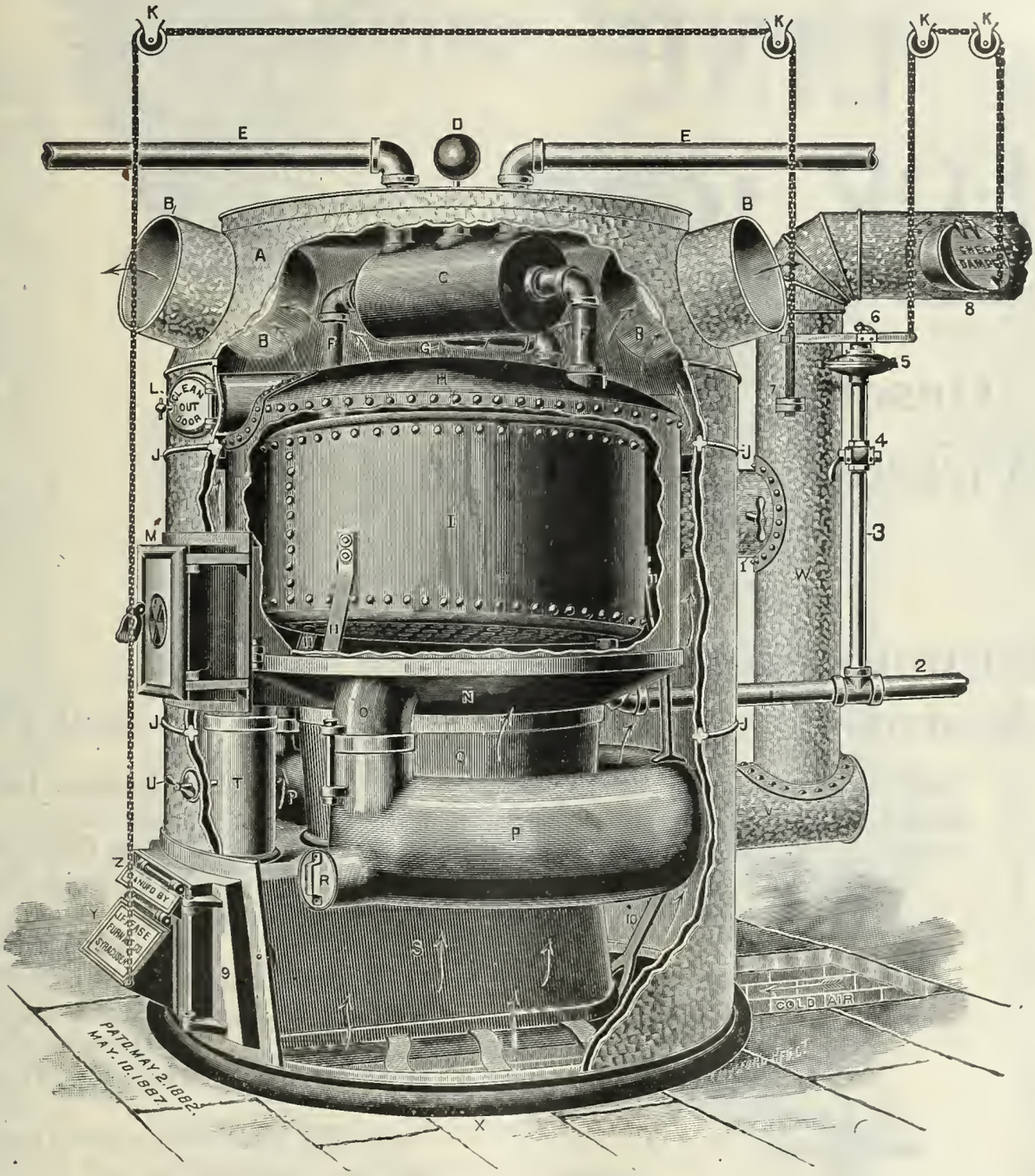
Different People Look at Different Things Differently,

But Every Intelligent Man Knows that it is Wiser To Sell Good Goods.

THE PEASE-ECONOMY COMBINATION

For Steam and Warm Air,

IS A THOROUGHLY RELIABLE APPARATUS



LOW DOWN PATTERN.

The Economy Combinations were First in the Market.
There have been more of them sold, by far, than of all other makes put together.
In their present improved form they very closely approach perfection.

NOT EXPENSIVE, EITHER.

INTERNATIONAL HEATER CO., Utica, N. Y.

BOSTON, NEW YORK, CHICAGO, DENVER.

THE LARGEST MAKERS OF HEATERS IN THE WORLD.

THE MONARCH LINE FOR 1902.



Embracing as it does the most up-to-date and attractive patterns of

Gasoline Stoves,

Wickless Blue Flame Oil Stoves

and the

Famous Monarch Asbestos-Lined Ovens

Will be represented in the Middle West for 1902 by the following Sales Agencies:

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Central Supply Co., Des Moines, Iowa.
Newby Stove Repair Co., Kansas City, Mo.
Bartlett & Norris, Lincoln, Neb.
W. H. Gruenhagen, St. Paul, Minn.
M. F. Stellwagen, in Wisconsin.
Kellogg & Stokes Stove Co., Denver, Colo.
R. P. Smith, Houston, Texas.



The trade in the various States covered by these representatives will be given the very best service possible and their interests given the most careful attention

Have you a copy of the Catalogue?

If not drop a postal to any of the above and it will come on the jump.

. . . THE . . .

Monarch Stove & Mfg. Co.,

MANSFIELD, O.

QUICK MEAL

Gasoline Stoves.



SIMPLICITY has made the "**QUICK MEAL**" **popular** with the **trade.**

SIMPLICITY combined with **first-class materials** made by **first-class workmen** under the instruction of a **first-class designer,** is what has made and kept the "**Quick Meal**" **Evaporating Stoves** in the lead at all times.

SIMPLICITY has made the "**QUICK MEAL**" easy for the dealer to sell, easy for the user to understand and keep clean. That is why there are more "**Quick Meal**" **Evaporating Stoves** sold to-day than **all others combined.**

SIMPLICITY, DURABILITY AND APPEARANCE is what makes the "**QUICK MEAL**" the **leading gasoline stove.**

They are the profit makers.

P S.—"Quick Meal" Steel Ranges attract the Eye, please the Cook, and make Friends for the Dealer.

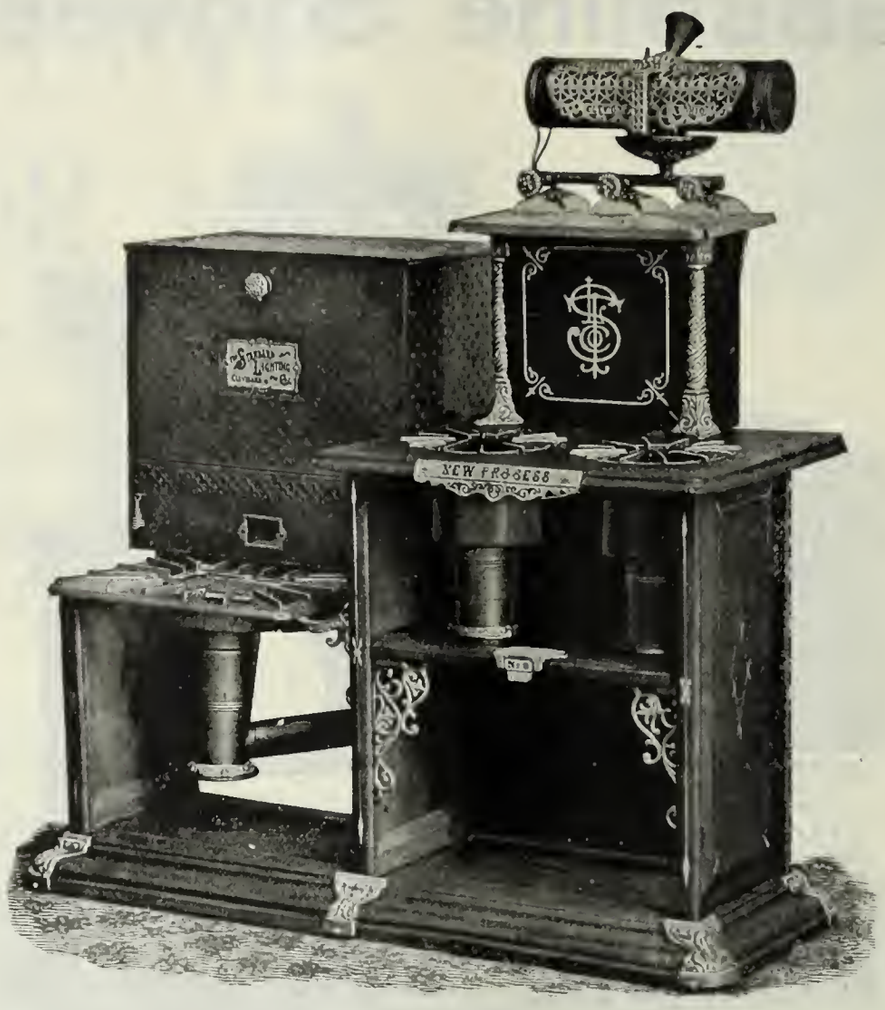
RINGEN STOVE Co. SAINT LOUIS

Old as the Oldest, New as the Newest.

If You Are Not, You Ought to be Selling

The "NEW PROCESS" VAPOR STOVE

The Most Popular and Successful Gasoline Stove Ever Made.



You have made a friend and some money, when you have sold a "New Process." Don't grope in the dark for "maybes," when, in the bright light of experience, you can buy a "sure thing" success.

No better recommendation can be given the "New Process" than that the following successful Jobbers after years of experience still sell it. Write them now for the agency.

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F. M. BORDEN & BRO., Philadelphia, Pa.

EUGENE MUNSELL & CO., New York, N. Y.

THE S. M. HOWES CO., Boston, Mass.

SOUTHERN JOBBERS.

W. B. BELKNAP & CO., Louisville, Ky.

THE NORTHWEST.

FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.

PACIFIC COAST STATES.

HOLBROOK, MERRILL & STETSON, San Francisco, Cal.

DOMINION OF CANADA.

THE THOS. DAVIDSON MFG. CO., . . Montreal, Quebec.

WESTERN JOBBERS.

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MORLEY BROS. . Saginaw, Mich,

TOWNLEY STOVE CO., Terre Haute, Ind.

F. TIEMANN STOVE & HDWE. CO., St. Louis, Mo.

TOWNLEY METAL CO., Kansas City, Mo.

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M. P. BORDEN STOVE CO., Denver, Col.

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1902

THE TWIN BURNER

Line for the New Year is far and away ahead of anything yet shown in

Gasoline and Oil Stoves.

GET OUR CATALOGUE. SENT FREE.

TWIN BURNER VAPOR STOVE CO.

206-210 South Seventeenth St.,

ST. LOUIS, MO.



No. 480.

Our New No. 480 can be used for Gasoline or Coal Oil.



THE ONLY SAFE GASOLINE STOVE MADE.

NATIONAL STOVES

LORAIN, OHIO, CHICAGO, 104 Lake St.

"Insurance"

SALES AGENTS.

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A. C. BARLER MFG. CO., - Chicago, Ill.

HARPER & McINTIRE CO.

OTTUMWA, IOWA.

For IOWA, NEBRASKA. KANSAS, MISSOURI.



OUR

CATALOGUE,

SHOWING

GAS RANGES
CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS

WILL BE FURNISHED FOR THE ASKING BY

Enterprise Stove Co., VINCENNES, IND.

JEWEL STOVES AND RANGES..

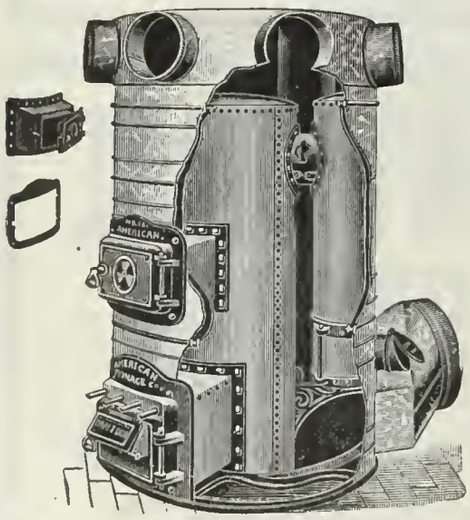


A Complete, Well Advertised Line; Low Prices and Good Workmanship.

Please Write for Catalogue.

DETROIT STOVE WORKS.

Detroit - Chicago.



Some Ripe Experience

Has come to us through watching the doings of dealers throughout the United States.

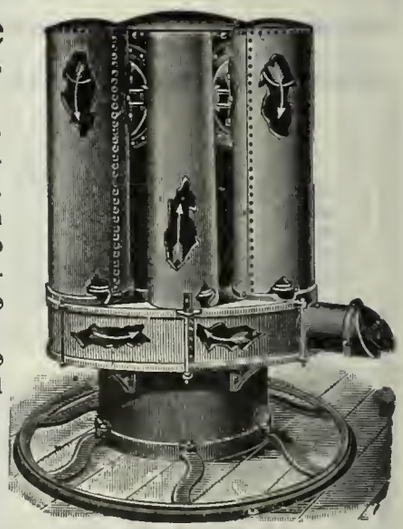
We find that the dealer who sells cheap furnaces not only loses ground in the furnace business but also has a falling off in his other lines.

On the other hand, we can say that the man who sells a good furnace and charges enough to do a good job will, in a few years, be the leading furnace man in his town and at the same time build up his other business.

The ***American Furnace*** is made for the better class of trade; is durable, clean and economical in fuel.

The American Furnace Co.,

1911-13 PINE STREET, ST. LOUIS, MO.



Burn Hard or Soft Coal, or Coke. Large Doors.

Large Radiators, easy to clean out.

Write for prices and secure the agency before the other fellow gets it

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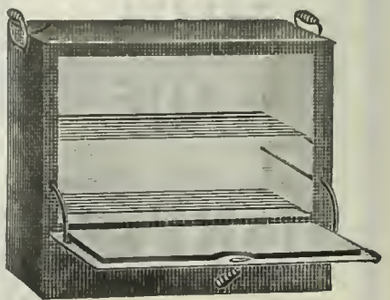
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Asbestos Lined Ranges and Ovens, Cookers and Hot Plates.

FOR ALL GASES.



Catalog No. 35 on application.



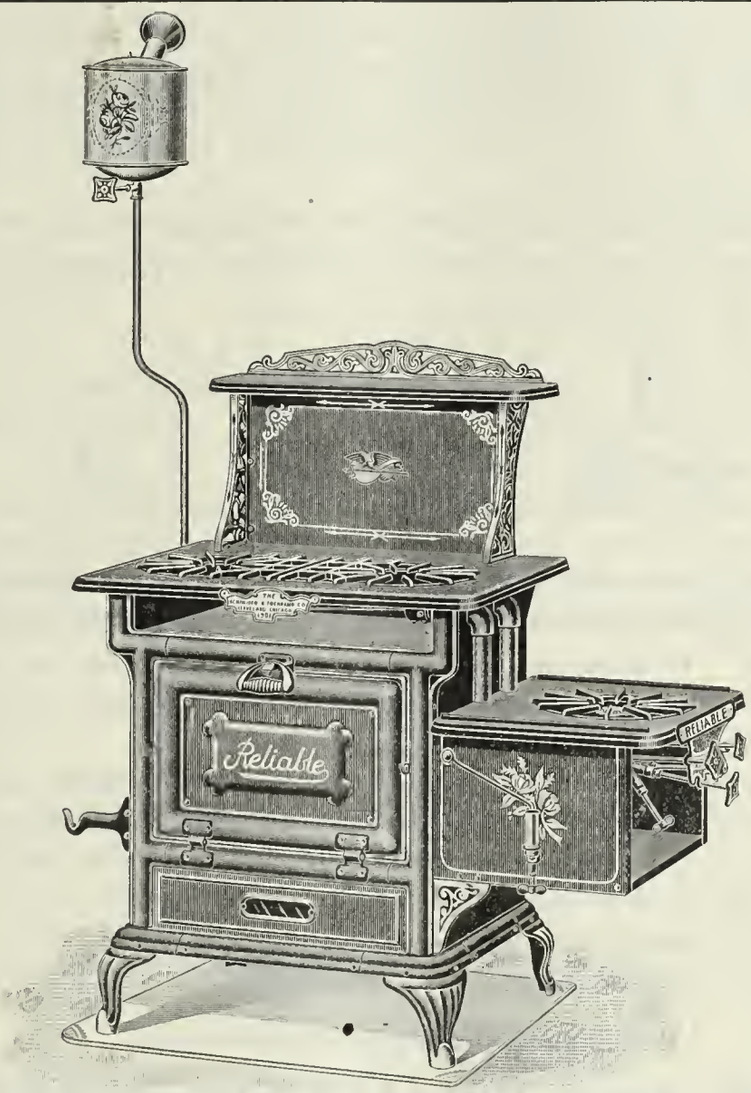
H. ADLER CO.,

PITTSBURG, PA.

HENRY WATERMAN, - - 195 Lewis St., N. Y., Eastern Agent.

Reliable Vapor Stoves and Ranges for 1902.

DEALERS who are seeking a strictly high grade line of Vapor Stoves and Ranges that are standard the country over cannot afford to overlook our line. "**RELIABLE**" Stoves have the NAME and FAME as being the best and most successful to handle.



THERE are NONE better. A few are claimed as good. None as well and favorably known. Our reputation will not permit of our making any inferior goods. If you wish to control the Vapor Stove business of your city, secure the agency of the "**RELIABLE.**" They have proved profitable and satisfactory to thousands in the past, and will to you.

Our line for 1902 is larger and finer than ever. Send for our latest catalogue. It is yours for the asking.

MADE BY

The Schneider & Trenkamp Company,

CLEVELAND. CHICAGO. SAN FRANCISCO.

When You Talk...

furnace to a customer you cannot reasonably expect him to drink in all you say as inspired truth.

It may be the truth, but that cuts no figure. It is what that customer believes down in his own heart that counts.

The Peck-Williamson Underfeed Furnace argues for itself. It shows by its construction precisely what it will do and why it will do it. Your customer can see it. He can't dodge it, in fact. The evidence is there before his eyes, and it needs no elaboration by word of mouth.

This furnace requires less fuel than any other. On top of that it gives more heat than any other. There is no way it can help but compass these two points. It is built expressly to do just that.

Mark this: In the ordinary furnace new coal is fed on top of the fire, and much of the products of combustion escape in the form of smoke.

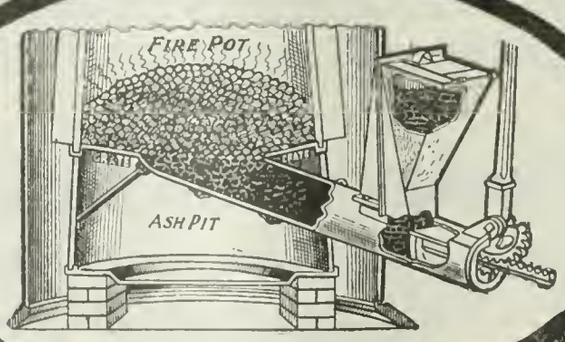
Not so in the Peck-Williamson Underfeed Furnace, because the fuel is fed up under the bed of live coals and the escaping and volatile gases are obliged to pass through that bed of live coal. It is the only outlet and they are therefore burned. This not only prevents smoke, but saves an appreciable percentage of the heat units which are wasted through the chimney in the ordinary furnace.

Why not handle a furnace that will do its work and do its saving so noticeably as to excite comment? Do you suppose for a moment that the Peck-Williamson Underfeed Furnace would be built as it is if it were an experiment?

Our handsome new booklet tells the whole story. It is yours for the asking.

THE PECK-WILLIAMSON COMPANY,

Cincinnati, Ohio.



THE H.B.SMITH CO.,

WESTFIELD, MASS., U.S.A.

Catalogue furnished only upon application to

Heating Contractors, Engineers and Architects

64 Pages. Size 9 x 12 Inches.

INDIRECT RADIATORS

(16 STYLES)

PACIFIC COAST AGENTS

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EUROPEAN AGENTS

AUG. EGGERS,

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SALESROOMS:

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510 ARCH STREET,
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Royal Heaters.

MANUFACTURED BY THE

HART & CROUSE Co.

UTICA, N.Y.

ALL THE LEADING LINES OF

STEAM, HOT WATER & HOT AIR,

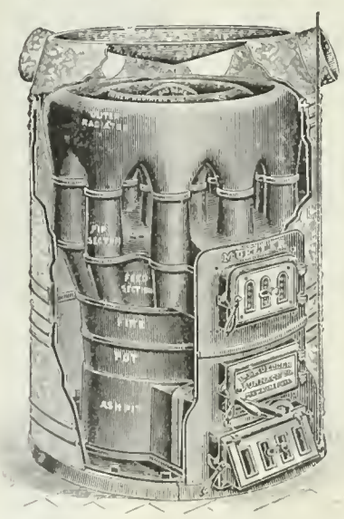
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COLUMBUS, O.

BRANCHES.

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ST. LOUIS.

DOUBLE RADIATOR. ALL CAST.



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Dealers Handle

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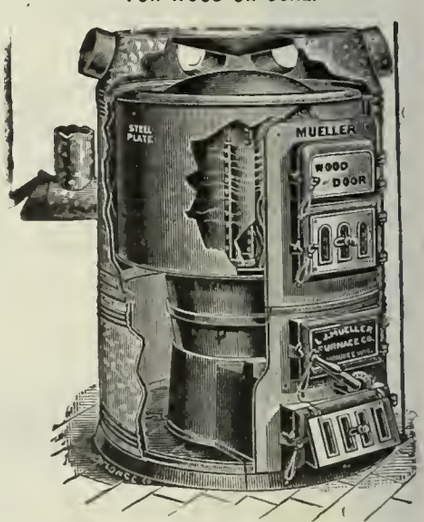
Furnaces and Boilers,

BECAUSE THEY ARE

THE BEST.

Everything in the Heating Line.
Get Our Special Register Offer.

FOR WOOD OR COAL.



L. J. MUELLER FURNACE CO., 190 REED ST., MILWAUKEE, WIS.

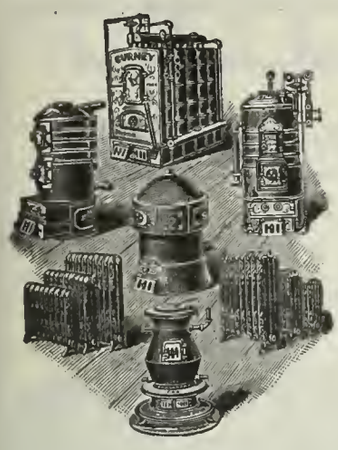


WINCHESTER

Our office is full of statistics bearing upon the efficiency of the "WINCHESTER" Heater, as compared with others. If you have been using a heater on which you wish to improve, give us an opportunity to prove to you the merits of the "WINCHESTER." Two to one you become an agent. Done. When shall we demonstrate? Smith & Thayer Company, Boston, Mass.



HEATER.



Even members of the same family are not always alike in virtue or ability, yet the

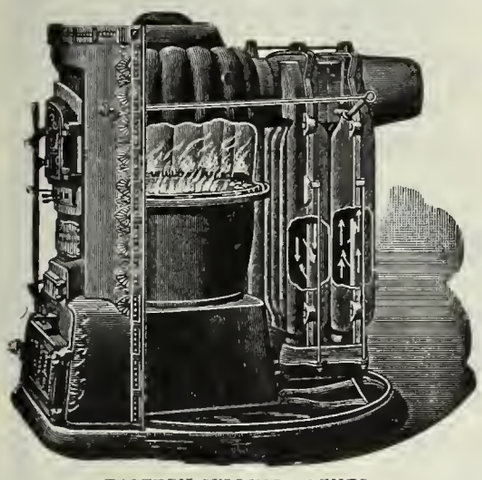
Gurney Heaters

Are of uniform excellence. In all of them the heating surfaces are so arranged as to produce a maximum of heat from a minimum amount of coal.

All are made from the best grades of iron, have the most efficient types of grates, and embody all the latest improvements. "Bright Idea," "Doric," and "400 Series" Steam and Hot Water Heaters are thus equipped. Sales of any of them will enhance your reputation. Would you become an agent? Let us hear from you.

GURNEY HEATER MFG. CO., 74 Franklin Street, Boston.
111 Fifth Ave., New York City.

Western Selling Agents, JAMES B. CLOW & SONS, 222-224 Lake St., Chicago, Ills.



Bengal Furnaces.

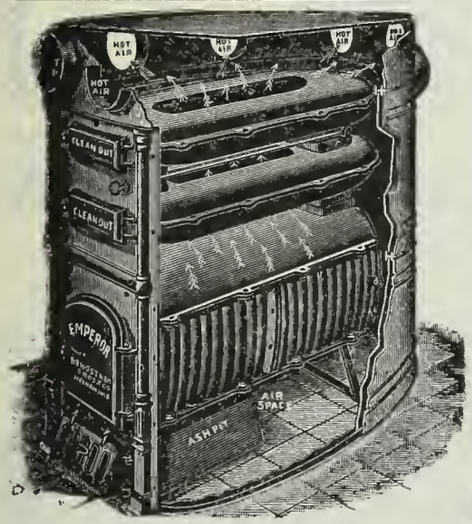
Without a Competitor.

THEY SHOULD LEAD YOUR LINE AS THEY DO OTHERS.

SECURE A BENGAL AGENCY AT ONCE.
CATALOGUE ON APPLICATION.

EASTERN SELLING AGENTS:
GURNEY & CO.,
Washington, Hanover and Elm Streets, Boston, Mass.

FLOYD, WELLS & CO., Royersford, Pa.



Emperor Furnaces

FOR WOOD.

Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces. . . .
Furnished for either Brick or Galvanized Iron Casing.

SEND FOR CATALOGUE.

Bergstrom Bros Co

NEENAH, WIS.

GILT EDGE FURNACES AND COMBINATION HEATERS.

Registers, and Tin and Galvanized Iron Furnace Fittings.

MANUFACTURED BY

R. J. SCHWAB & SONS CO., = Milwaukee. Wis.

BRAND STOVE CO.

STOVES, RANGES and FURNACES.

SEND FOR CATALOG.

MILWAUKEE, WIS.

OLD LYME, CONN., January 15th, 1902.

DIGHTON FURNACE CO., Taunton, Mass.:

GENTLEMEN—I suppose it is time something was said about the "Dighton" Furnace in the Church at Old Lyme.

I am the Janitor of the Church and I must say your Furnace is giving great satisfaction, and I have no trouble in heating the building.

We have had some cold Sundays since the Furnace was put in, but I was able to keep the temperature over 70° without putting on any draft or pushing the Furnace any at all. I must say it is one of the best Furnaces I ever saw. It combines simpleness, cleanliness and efficiency which I think cannot be equalled by any other at present.

If I wanted to go into details about it, I could tell you some of the things it has done, but I will relate one: One Saturday night I did not put on a large fire, but just enough, I thought, to keep it going until morning. During the night a change came, and in the morning the wind was blowing a gale from the North, with the temperature 6° above zero and found the fire dead out and the Church temperature just 34°.

I dumped the fire and put on full draft, and by 11 o'clock, when service commenced, the temperature was 68°, and by 12 o'clock I had to open the doors. If this is any use to you as a testimonial do not hesitate to use it.

Yours respectfully,

JOHN KANE, Sexton Lyme Church.

Your Guarantee is Good,

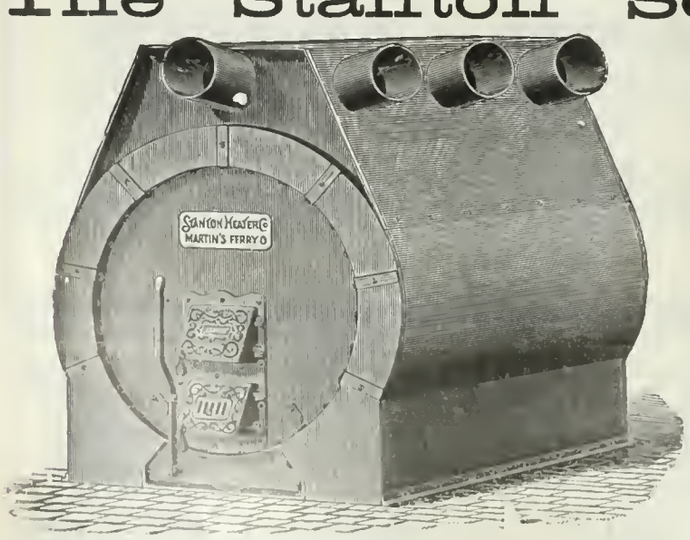
If backed up by our line. We make many kinds and sizes of steam and hot water boilers, and you as a dealer ought to know all about this line. Let us send you our printed matter and post you on the standard line. Write to-day.

KEWANEE BOILER COMPANY

KEWANEE, ILLS.

The Stanton Seamless Heater,

PORTABLE CASED.



STATE COLLEGE, PA., June 15, 1900.

THE STANTON HEATER CO., Martin's Ferry, Ohio.

GENTLEMEN:—The Stanton Heater is giving the best kind of satisfaction. It will produce good heat from any kind of fuel. My average cost of fuel, per month, for the past winter was three tons of coal dust from soft coal to heat 43,000 cubic feet of space with a No. 68 Heater; however, this space is 3,000 cubic feet over the capacity of your Heater, but the heater did the work easy, and held the temperature in zero weather so it would not change over four degrees in twelve hours without touching the Heater.

The Stanton Heater is, in my judgment, the most modern and economical warm-air generator of this age.

Sincerely yours, J. N. KRUMRINE.

SEND FOR CATALOGUE.

THE STANTON HEATER CO.,

Martin's Ferry, Ohio.

See Our Advertisement Next Week.

Gurney

HOT WATER GENERATORS
HOT AIR GENERATORS
STEAM GENERATORS
RANGES *and* STOVES
REFRIGERATORS
STEEL RANGES
GAS RANGES
FURNACES

GURNEY AND COMPANY

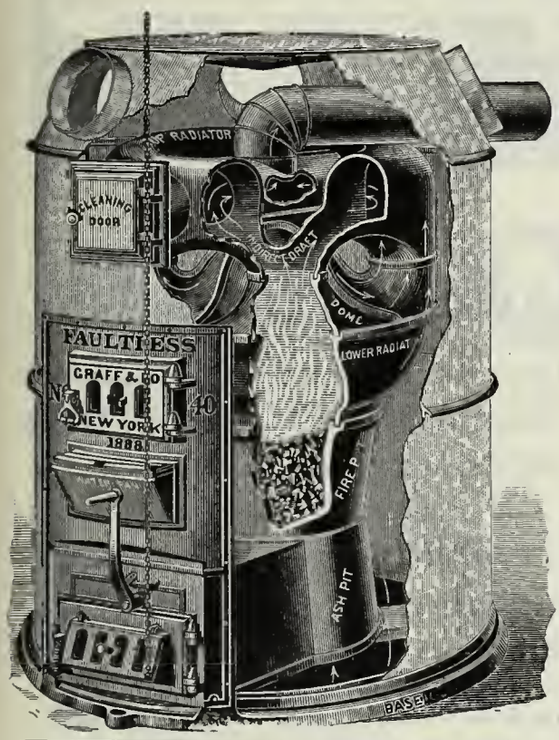
WASHINGTON, HANOVER AND ELM STREETS

BOSTON, - MASSACHUSETTS

FAULTLESS FURNACES.

Hard Coal Style.

Soft Coal Style.

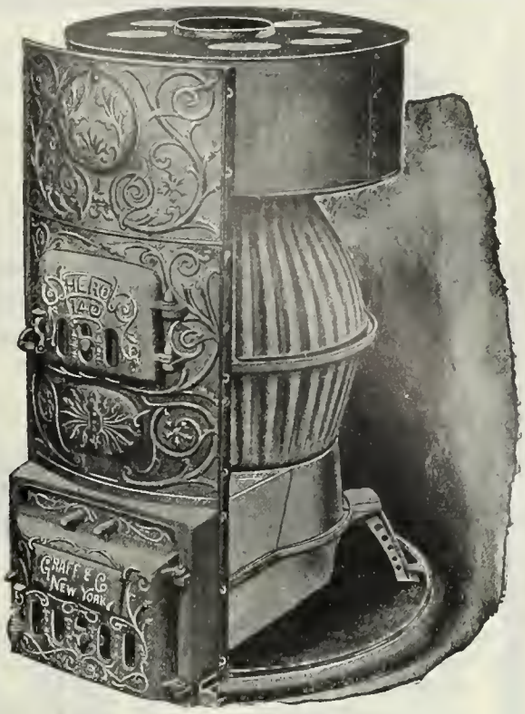


The Graff Furnace Co.

Manufacturers,

208 Water Street, New York.

ALSO CHEAPER FURNACES IF YOU WANT THEM.

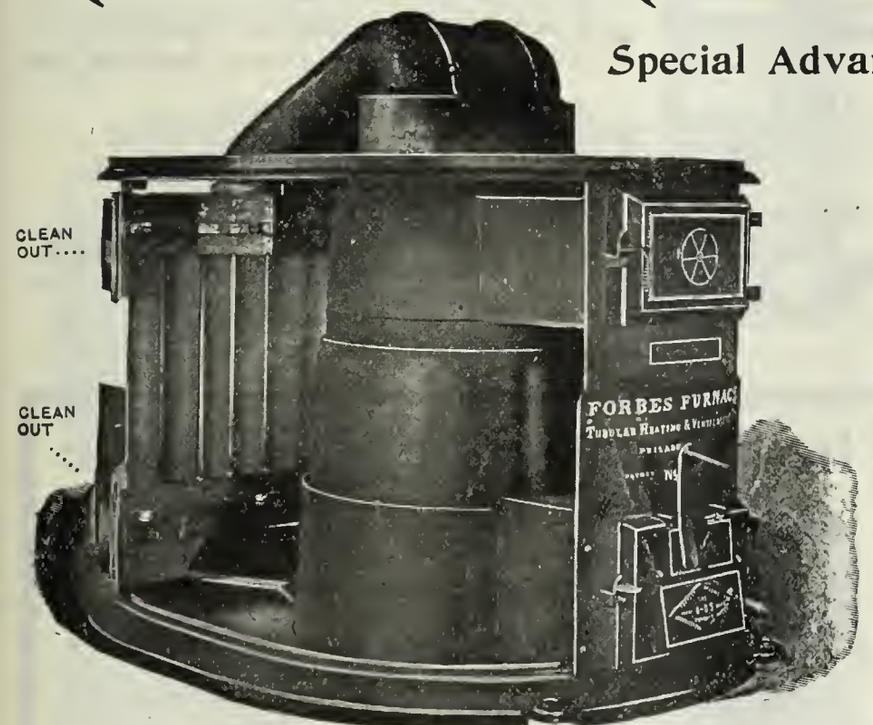


HERO FURNACES.

Hard Coal Style.

Soft Coal Style.

READ OUR OFFERINGS.



Special Advantages Over All Other Heaters.

OUR HEATERS are only 4 ft. 3 in. high, giving excellent elevation for Hot Air Pipes.

OUR HEATERS ARE ALL CAST IRON, no repairing of sheet iron drums necessary every few years.

OUR MANIFOLD TUBES are steel, ⅛ inch thick, and will wear for a lifetime.

OUR HEATERS are supplied with the most modern grates, perfect dumping and shaking. Each bar can be separately replaced.

OUR HEATERS are so arranged that they can be perfectly cleaned by any one, and in a few moments.

Equally Efficient with Hard or Soft Coal.

Our Heaters save the heat others waste up the chimney and send it through the house, therefore reduce coal bills.

SEND FOR CATALOGUE, REFERENCES AND FULL PARTICULARS.

TUBULAR HEATING AND VENTILATING CO.

MANUFACTURERS of the FORBES WARM AIR FURNACE.

232 Quarry St., PHILADELPHIA, PA.

HOT WATER AND HOT AIR

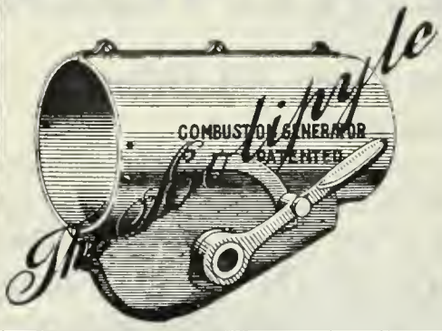


HEATING BY COMBINATION STOVES AND FURNACES.

Suitable for Large or Small Houses, Stores, Conservatories, Barber Shops, Hotels, etc., etc.

Heat Water Quickly.
Circulation is Positive.
No Joints Inside to Leak.

THE NATIONAL PIPE BENDING CO
160 RIVER ST., NEW HAVEN, CONN.



Saves Coal, Increases Heat,
Keeps Temperature Even,
Prevents Escape of Coal Gas,
Reduces Labor,
Avoids Sifting Ashes,

When Applied for Domestic Use to Smoke Pipe of

House Furnace,
Hot Water Heater,
Low Pressure Boiler,
Stove or Range.

Æolipyle Company,
237 Water St., New York,
Tel. 1849, John. U. S. A.

SCRANTON CORUNDUM & EMERY WHEEL CO.
1311-1315 Capouse Avenue, SCRANTON, PA.
Write for Catalogue.
OUR "BLACK DIAMOND"
artificial abrasive wheels are especially adapted for
The Stove Trade
THEY ARE THE BEST.

STAMFORD FOUNDRY COMPANY

MAKERS OF

RANGES COOKING AND HEATING STOVES
HOT-AIR AND COMBINATION AIR AND
WATER FURNACES
LAUNDRY STOVES CONFECTIONERS' STOVES
CABOOSE RANGES ETC ETC

STAMFORD CONN



Vance Boilers.

The most economical Steam and Hot Water Boiler on the market. Write for Catalogue and Price List.

VANCE BOILER WORKS,
373 Atkinson St., Geneva, N. Y.

"TORRID HEATER."
FOR STEAM OR HOT WATER.



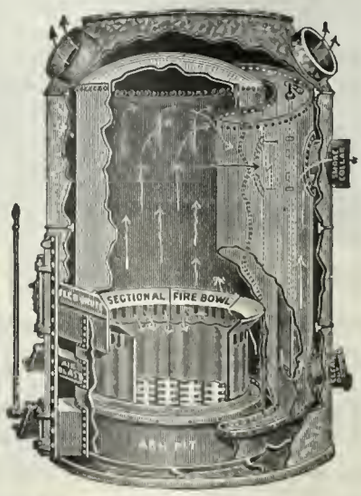
It is Practical in Design.
It is Safe, Being Tested to 200 Pounds.
It is Easy to Manage and Keep Clean.
It is Durable.
It is Sectional and Easily Handled.
It has No Packed Joints.
It is Self-Feed or Surface Burning.
It has the Torrid Patent Rocking and Dumping Grate.
It is Low in Price.

SEND FOR CATALOGUE.

MANUFACTURED BY

W. H. DRAKE, No. 36 Clinton St., NEWARK, N. J.
Factory: Hackettstown, N. J.

The Torrid Zone Furnace



is a trade winner because it has points of merit peculiar to itself that can be found in no other steel furnace. Our new catalogue is now ready to mail and a description of our Hot Air and Hot Water Combination Furnace can be seen in it. We furnish either the cast iron lining or the fire brick at the same price. Our Wood Furnace is called a powerful heater by those who use it.

CATALOGUE FREE.

Lennox Manufacturing Company,
Eighth Ave. and Frederick St.,
MARSHALLTOWN, IOWA.

They regulate heat in residences, offices, stores, mfg. plants. Guaranteed.

The Howard Thermostat Co.

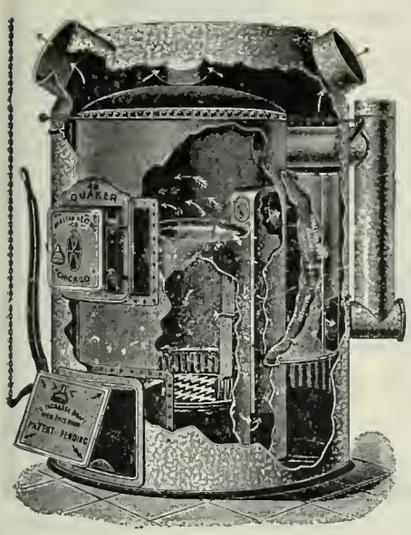
West Water Street, Oswego, N. Y.

No electricity or compressed air Simple as a heavy spring motor can be.

Would like to send you their catalogue and give a few reasons why you should sell their Heat, Valve, Draft and Damper Regulators. This should be an interesting topic. We have the most simple thermostat made; also the most sensitive. Only three parts—a sensitive and powerful sensitive plate, a heavy spring motor made of brass and common pulley connections. Just enough material to do the work satisfactorily, but not one atom too much. They do "straight work," without the aid of outside agencies. No other thermostat on the market can do more with all of its electricity and compressed air connections.

THEY SAVE THE COAL

WHICH IS WASTED BY THE WRONG OPERATION OF FURNACE OR BOILER DAMPERS.



Quaker



furnaces, also Panama, Hoffman, Low Down and combination hot water. Quaker Time Clock Regulator, Side Wall Registers, Pipe and Fittings and a full line of furnace supplies. A complete outfit for installing a warm air or combination plant all supplied by us made at our own foundry and machine shop and works. Live Agents wanted. Send for prices and catalogues. Special attention given to complete plant orders and car-load lots.

Wireton Heating Co.,

FACTORY AND OFFICE, BLUE ISLAND, ILL. CITY OFFICE, 40 DEARBORN ST., CHICAGO.

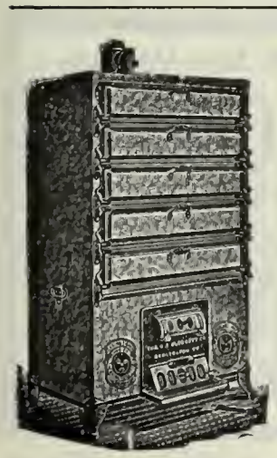


Brien Heater.

A perfect, all cast WOOD or COAL burner. There is no other Hot Air Furnace as low down as the "BRIEN."

Write for territory, catalog and prices.

BRIEN HEATER CO.,
HOOSICK FALLS, N. Y.



CABINET PORTABLE OVEN.

OUR LATEST PRODUCTION.

BAKES EVENLY BY THE CIRCULATION OF HOT AIR.

FOR BAKERS, CONFECTIONERS, HOTELS,

Also the best oven for Core Baking, Japanning, Enamelling, etc.

Made in six sizes, single and double, for coal, wood, natural or artificial gas.

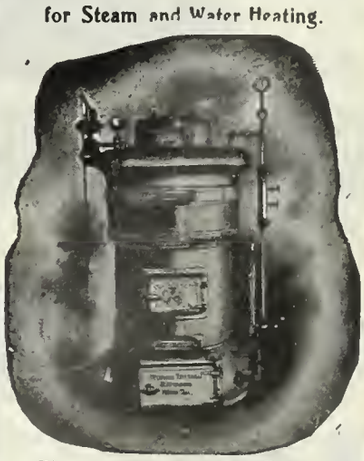
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The G. S. BLODGETT CO., Burlington, Vt., U. S. A.

Pierce

BOILERS and RADIATORS

for Steam and Water Heating.



Pierce Touraine Steam Boiler.

LARGE HEATING CAPACITY.
ECONOMIC IN FUEL CONSUMPTION.

Endorsed by the foremost Architects and Heating Engineers.

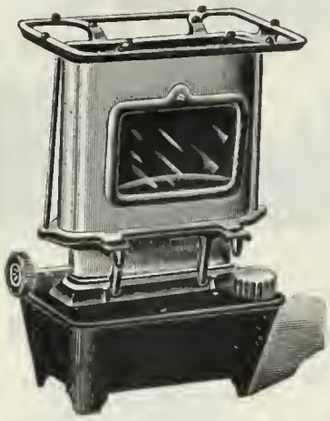
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Pierce, Butler & Pierce Mfg. Co.,
Syracuse, N. Y.
New York. Boston. Philadelphia.

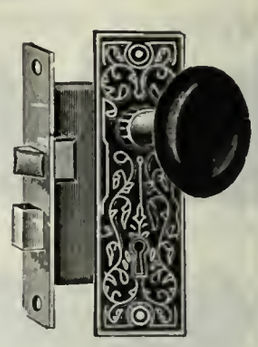
THE TAYLOR & BOGGIS FOUNDRY CO.,

MANUFACTURERS OF

LIGHT GRAY IRON CASTINGS.



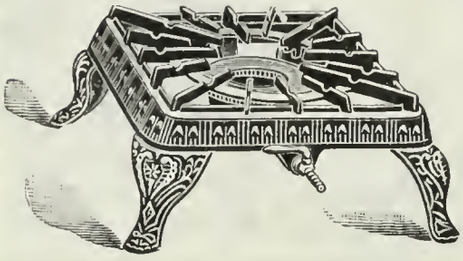
Builders' Hardware,
Dampers, Oil and Gas Stoves,
Japanners and Electroplaters.

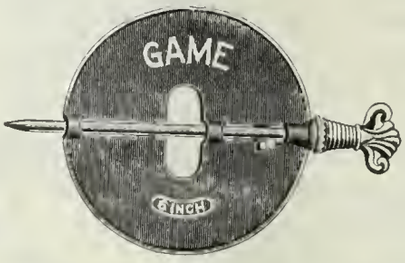


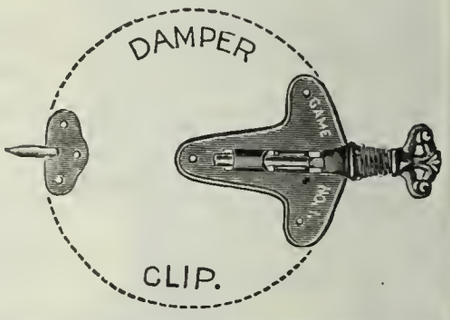
OFFICE and Foundry No. 1—521 to 541 Seneca St.
Foundry No. 2—C. & P. R. R., near Euclid Ave.
Lock Dept.—C. & P. R. R., near Euclid Ave.

CLEVELAND, O.

New York Representative, J. M. Litchfield, 105 Beekman St.
San Francisco Representative, H. A. Potter, 35 New Montgomery St.







The Champion Hot Water Combination Boilers.

They Fit Any Furnace.



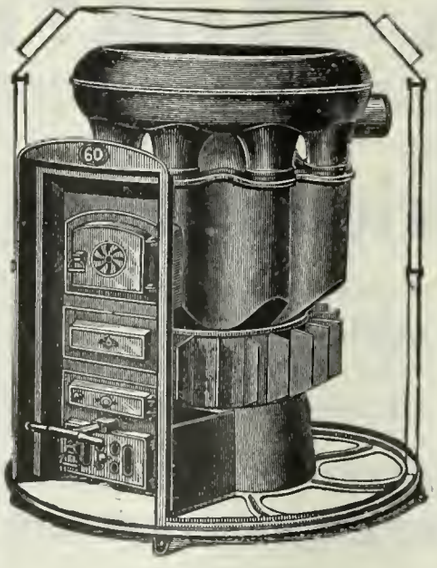
Base section when used without ring sections.

Ring Section.

These Boilers are made in three sizes diameter, and from 100 to 600 square feet radiation capacity.
Will heat those cold rooms, or an addition to the building. Will increase the capacity of any furnace. Are cheaper than coils and will do more work.
Write for new circular. Manufactured by

FRANK D. STOLZ,

115 Lake St., Chicago, Ill.



Imitation is Flattery.

Cory's All Cast FURNACES

HAVE BEEN COPIED
BUT NEVER EXCELLED.

An Absolutely Gas Tight Furnace
Without Bolted Joints.

UZAL CORY & CO.,
210 WATER ST., NEW YORK.

Established 1847.

We Protect Dealers

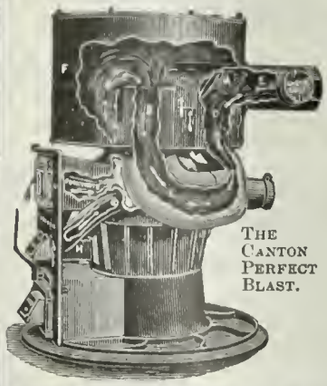
WHO HANDLE BURTON'S



FUEL ECONOMIZER.

Give us a trial order.

W. J. BURTON & CO.,
164-166 W. Larned Street, Detroit.



THE CANTON PERFECT BLAST.

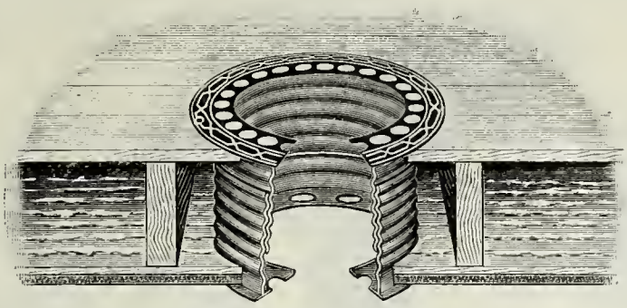
CANTON PERFECT BLAST AND OAK

WARM AIR FURNACES

Heavy Castings, Tubular Radiator,
Large Secondary Radiator,
A Perfect Blast,
ALL INSIDE THE CASING.

THE BONNOT COMPANY, Canton, O.

PATENTED IN U. S. and CANADA.



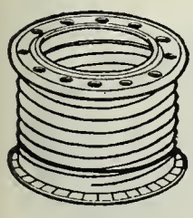
THE O. K. IS A NOVELTY.

THE EASILY ADJUSTED

O. K. STOVE PIPE THIMBLE

FOR PARTITIONS AND CEILINGS.

Made in two parts which screw together and adjust to any thickness of floor or partition. They hold the plaster firmly and are not loosened by any agitation of smoke pipe. Have no springs to get out of order or no loose parts. Made of bright tin with ends handsomely japanned.



Price Same as Other Old Style Thimbles.

Trial orders solicited through jobbing trade or direct. Travellers' model samples supplied.





O. K. MANUFACTURING CO., 45 N. Division St., BUFFALO, N. Y.

CANADIAN REPRESENTATIVES,
THE METAL SHINGLE & SIDING CO., Ltd., Preston, Ont.

20th Century Gas Stoves

THE BEST GAS STOVE MADE.

Best Materials and Workmanship. Prices Low. Mail Orders Promptly Filled.

STOVE REPAIRS IN STOCK FOR 2,000 STOVES AND RANGES.

Write for Prices.

THE METROPOLIS SHEET METALS AND STOVE REPAIRING CO.,
261-261½ Springfield Ave., Newark, N. J.

MICA

EUGENE MUNSELL & CO.
MINERS & IMPORTERS
NEW YORK 218 WATER ST. CHICAGO 117 & 119 LAKE

SELECTED

MICA

ONLY.

Prepared expressly for the Stove and Hardware Trade.

Two Grades: "North Carolina" and "Nevada."

PRICE LISTS AND DISCOUNTS SENT ON APPLICATION.

THE PALERMO MICA CO.,
115 Beekman St., New York.

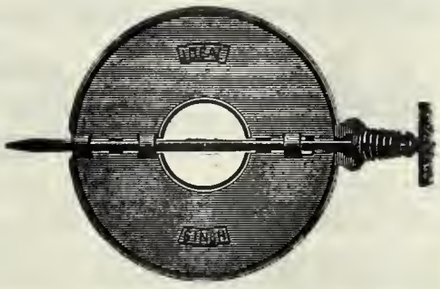
MICA

Specially Prepared for the Stove Trade.
OHIO MICA CO., CANTON, OHIO

PATTERNS

FOR STOVES AND HEATERS.
First-class in wood and iron.
Vedder Pattern Works, - Troy, N. Y.

IDEAL DAMPERS, COVER LIFTERS



AND POKERS



HAVE NON-HEATING HANDLES OF ELEGANT DESIGN AND FINISH. THEY ARE THE BEST.

STOVER MFG. CO.
164 RIVER ST.,
FREEPORT, ILLS.



THE SUN AND RICHMOND HEAT THE WORLD.

RICHMOND HEATERS

ARE EFFECTIVE IN ALL KINDS OF WEATHER.

POWERFUL, ECONOMICAL, AND EASY TO REGULATE.

Write for Catalogue.

The Richmond Stove Co.
NORWICH, CONN.



A good time to learn about

Independent Registers

is Right Now.

100 Sizes. Prompt Shipments.

WRITE US.

Independent Register Co.,
152 CHAMPLAIN STREET,
CLEVELAND, O.

BURDELL & FOWLER CLEV'D O.

THE S. & S. PATENT

Stove Pipe Thimble



Locks the Pipe from Pulling Out, and from Pushing In and Closing the Draught. Will last a lifetime. Nothing to wear out, and costs but a trifle. *Send for sample* and prices.

City Forge and Iron Works,
DAYTON, OHIO.

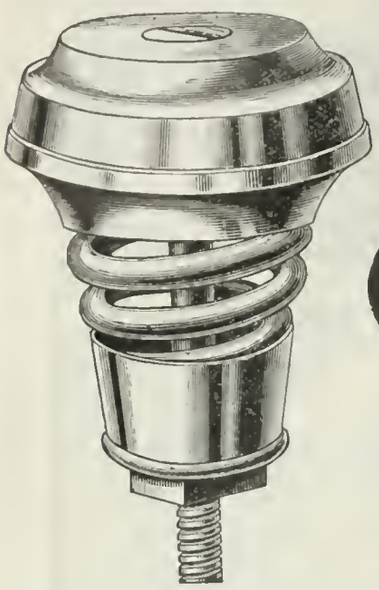


Hand Elevators and Dumbwaiters

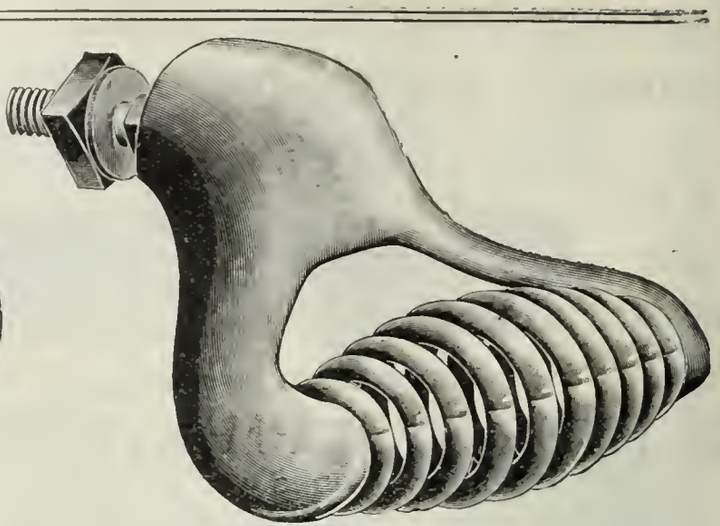
made to be sold by the Hardware trade. Can be placed in position by any carpenter, Catalogue free.

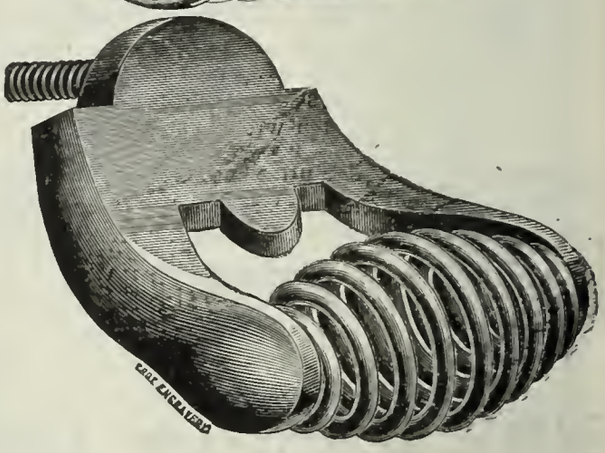
ENERGY ELEVATOR CO.,
410 Cherry St., Phila., Pa.

—At the bottom of a recent wedding card they put the legend: "No children expected." Well, they may not expect them, but it's dollars to dimes they'll have them.—*Ex.*









TROY NICKEL WORKS, Albany, N.Y.

ESTABLISHED 1880.

All The Latest Novelties in Stove Trimmings.

ALWAYS COLD.

If you want your stoves up-to-date you must use Alaska Stove Trimmings.

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We Stand for Reliability,

quality and honest value and our increasing sales convince us that the reliable, honest dealer has no use for cheap goods at cheap prices.

RUTLAND FIRE CLAY CO.,

60 Wabash Ave.,
CHICAGO, ILL.

NORTH EAST, MD.

Rutland, Vt.





"O.H." ONE PIECE STOVE PIPE Elbows

Perfectly round and true to size. With long ends, DOUBLE LOCK SEAM in throat or under side of Elbow.

HANDSOMEST, HEAVIEST AND STRONGEST STOVE PIPE ELBOW MANUFACTURED.

—SOLE MANUFACTURERS,—

THE LAWRENCE-LETTS ELBOW CO., Ltd., - - Waverly, N. Y.

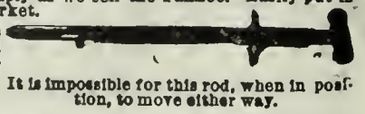


The YANKEE Hot Air DAMPER (Improved All Steel.

THE YANKEE EXCELS.

Above All—Cheapness—a dealer cannot possibly make dampers as cheaply as we sell the Yankee. Easily put in and taken out of pipes. Stiffest, quickest-working and neatest damper on the market.

ROD POINTS: Has wood enameled handle. Wood handle cannot come off. Washer and spring cannot fall off the rod. Same size of holes are punched on each side of pipe. Rod is made of ¼ inch cold-rolled steel and slips into damper very smoothly. **Sample sent to any Dealer without charge.**



It is impossible for this rod, when in position, to move either way.

The S. M. HOWES CO., Manufacturers, 40-46 UNION ST., Boston, Mass.

Sizes: 6, 7, 8, 8½, 9, 10, 10½, 11, 12, 12½, 14 and 15

NEW YORK: A. L. Canfield, 284-286 Pearl St. CHICAGO: Excelsior Steel Furnace Co.

MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

RANGE, STOVE AND HEATER REPAIRS

AND FIRE-BRICK LININGS,

74 Beekman Street, New York,

FOUNDRY, Perth Amboy, N. J.

FIRE-BRICK FACTORY 36 to 46 South Fourth Street, Brooklyn, L. I.

BRANCH STORES:

South Fourth Street, Brooklyn, L. I. 362 Grove Street, Jersy City, N. J.

CATALOGUES NOW READY.

FIRE BRICK LININGS

For all Stoves, Ranges and Heaters.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.

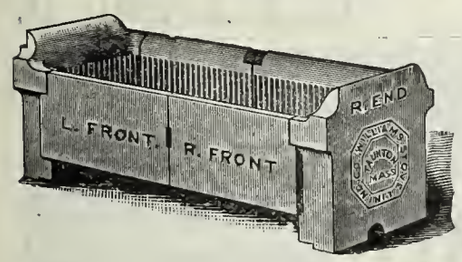
M. D. VALENTINE & BRO CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBRIDGE. N. J.

BRICK STOVE LININGS.



Eagle Stove Clay.

Incandescent Gas Fuel.

WILLIAMS STOVE LINING CO.,

TAUNTON, MASS.



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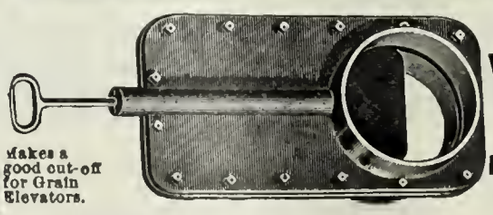


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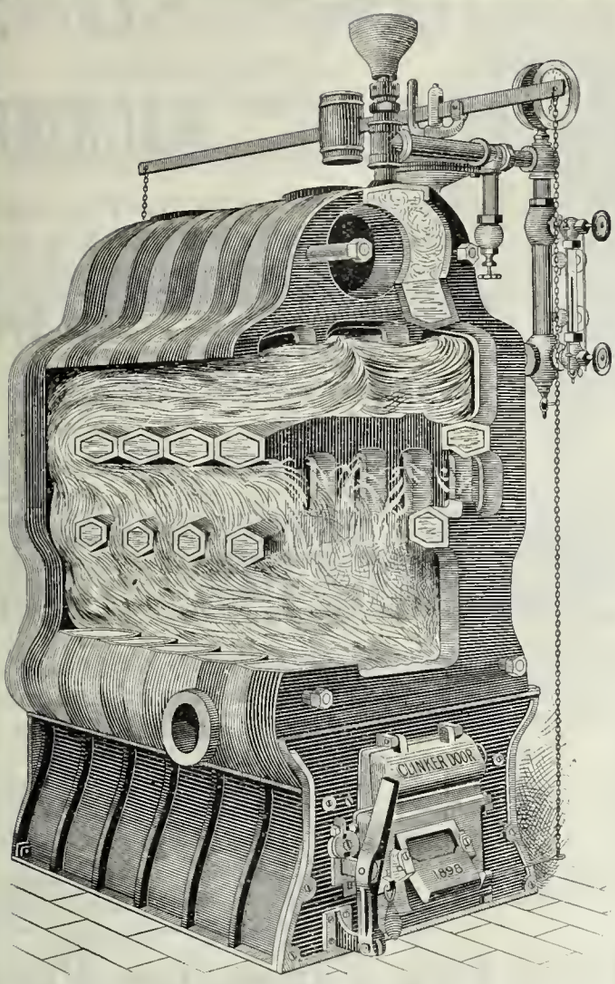
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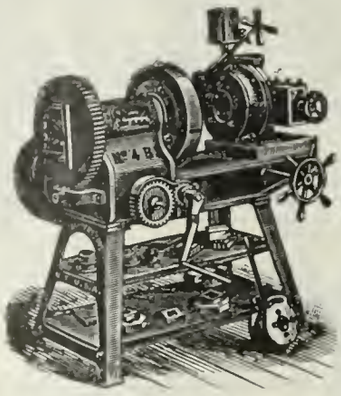
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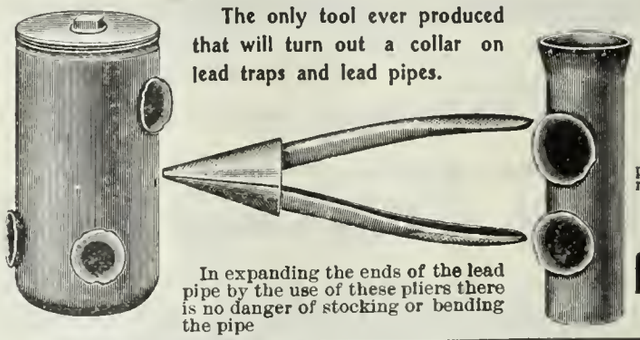
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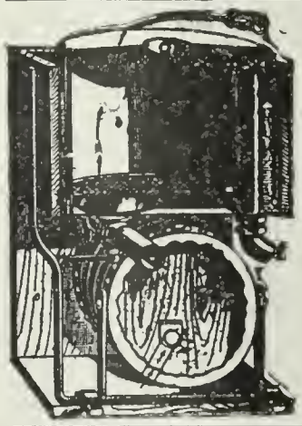
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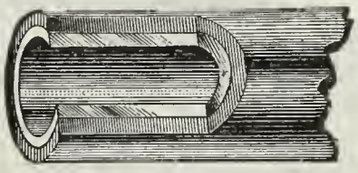
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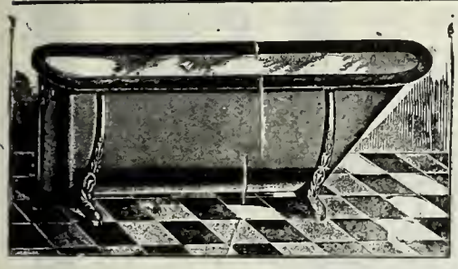
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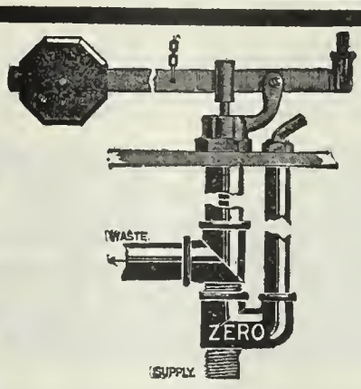
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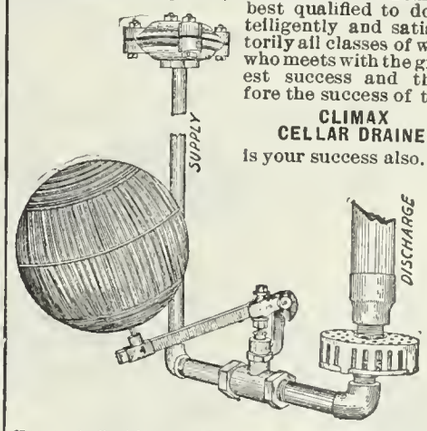
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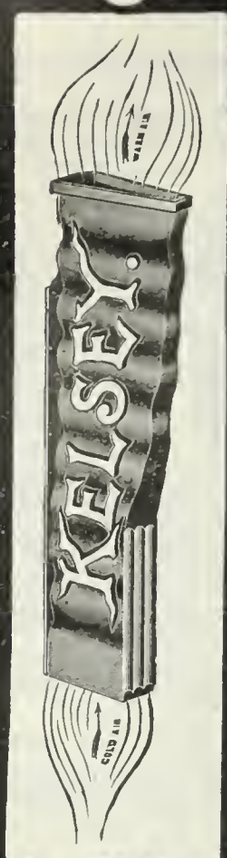
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NEW YORK AND CHICAGO.

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The Stove Trade.

The condition of things in the stove trade certainly calls for congratulation, and should be satisfactory to the manufacturers. It will be noted, as recorded in the following pages, that there is a tendency to make reasonable advances in prices, which are certainly justified by the condition of the iron market, while their necessity is enforced by the balance sheets of some of the manufacturers. At the same time there is a disposition on the part of manufacturers who have not always worked in harmony to correct what have been disturbing influences in the trade, which have been attended at times with a good deal of demoralization. This is notably true of the New York market. It is fortunate that this condition of things exists at the present time, which is the dull season for sales, and that the season soon to open gives promise of not only a large volume of business, but of general conditions which should tend to make it profitable. The very moderate advances which have taken place will not in any way interfere with the business of the retailers and will undoubtedly meet with general approval.

Consolidation in the Stove Trade.

The present month has been fruitful of rumors of consolidation in the stove trade. The matter of combining several plants under one management for the purpose of reducing cost and increasing the efficiency of the selling force has been pretty thoroughly thrashed over in all sections where stove manufacturing plants are found, and the idea has received the approval of many prominent men in this branch of trade. While such a consolidation has been consummated in the gasoline and oil stove trade, nothing of the kind has as yet been accomplished among the manufacturers of coal burning goods. Apparently the rumor that six of the large Western plants would consolidate had some plausibility. Consultation with some well informed men, however, has disclosed the fact that less interest is being taken in the subject at the present time than was given to it a short time ago. At the same time some of the leading manufacturers favor the idea if it can be accomplished upon a hard pan business basis. Following the rumor of this Western consolidation scheme there was a report that efforts were being made to effect an Eastern consolidation of equal magnitude. While it is not difficult to discover Eastern manufacturers who favor the idea, evidence of a successful outcome in this direction is as yet lacking.

Open Market for Plumbing Goods.

The tension between the different interests in the plumbing trade as yet has not been relieved, desirable as a settlement of the differences would be to all concerned on account of the effect it may have on the business of the year. On the one hand there seems to be a strong feeling among the plumbers that their complaints and demands have not received at the hands of the manufacturers the prompt attention and consideration to which they are entitled. On the other hand the representatives of the various supply associations feel that they have acted conservatively in giving reasonable time for deliberation on the questions brought to their attention, so that the entire membership might become thoroughly conversant with the issues and then express their opinions for the guidance of their representatives. The last month of the old year is a busy one for every manufacturer and supply house with a large number of accounts on their books which it is desirable to have in proper condition at the close of the year, and what with collections and stock taking, the head of a firm finds little idle time during the first month of the year. These considerations may have increased the delay in taking up the questions which the plumbers are impatient to have answered. It is this delay that has probably had something to do with the action of the plumbers in preparing the official list of their members about to be issued. This directory is apparently designed to provide supply houses with a list of plumbers to whom goods may be sold without incurring the displeasure of the plumbers' association. Whether this will lead to any general action by the plumbers in case goods shall be sold to plumbers not on the list remains to be seen. It is to be hoped that friction may be avoided through the influence that the conservative element in both bodies may exert to prevent any radical action.

Already, in some sections, but only in some sections, the manufacturers have been informed that the local master plumbers' associations has a grievance against them. This notice has been accompanied by the statement that if the grievance was not adjusted within a specified time the members of the association would be ordered to stop buying goods from such houses. The information in this correspondence has been placed in possession of all the manufacturers and supply houses. The result has been to revive the old suggestion of making an open market for plumbing goods. But an open rupture can be productive of no good to either of the interests concerned. There can be no doubt in the mind of any one well informed in regard to the protection given to the plumbing trade that it is the best protected trade in the United States to-day. Many of the more conservative plumbers are not only aware of this fact, but appreciate the protection received and find little sympathy with the hairsplitting or the demand for absolute and perfect protection which seems to have led up to the strained relations between the supply houses and the plumbers. Many of the supply houses feel that they have done everything in reason, and they are not only annoyed but irritated to the point of exasperation by the manner in which they are brought to book for petty violations and

infringements through errors in judgment and other oversights which it is found impossible to avoid.

It is asserted by some manufacturers that if the demands made by the master plumbers were carried out it would result in an action before the courts, where their greater responsibility would bring upon them heavier penalties than have been dealt out in the numerous cases throughout the country in which the methods of the master plumbers have brought them before the various courts in which they have been cited to appear. It is an old proverb that "half a loaf is better than no bread," and it would be far better for the master plumbers to accept the excellent protection which they now receive than to take action that would force such retaliatory measures as the making of an open market throughout the country on plumbing goods. An open market would mean that plumbing goods could be purchased from every corner hardware store just as other lines of metal goods can now be purchased. It is fortunate, however, for all concerned that some of the most active and influential members of the supply trade are arrayed against any such an open market scheme. On the other hand there are not wanting those who favor applying this sort of discipline to those customers who seem to court it.

The annual meetings of many State and local plumbing associations are now at hand, and no better opportunity than such meetings provide can be offered for a thorough discussion of the situation in the trade. It would be well to bear in mind that there are two sides to every question, and that to take one side or the other without a thorough consideration of all the points at issue is apt to lead to unsatisfactory and unprofitable strife. The differences which exist should be settled on the give and take principle. The final adjustment must be reasonable and mutually satisfactory or it cannot be permanent.

Selling Heating Apparatus.

A subject that is receiving no little attention, both from the manufacturers of heating apparatus and the contracting steam fitters, is the desire on the part of some of the large building construction companies to purchase material for the power and heating systems installed in the large buildings which they erect. The large contracting steam fitters naturally hold that such companies should not be allowed to purchase materials direct from the manufacturers. They are firmly of the opinion that the sale of heating goods, in whatever quantity, to a construction company would be a violation of the trade resolutions under which manufacturers and steam fitters are now harmoniously transacting their business. There has been no difficulty in disposing of this question under the old conditions, where the construction company contracted with a steam fitter to install the steam plant in a building. A new factor, however, has come into this branch of trade through the employment of a corps of steam fitters by some of these construction companies, who now desire to purchase at first hand all the goods needed in a power and heating plant. The manufacturers of such goods are thus placed in a perplexing position. They are confronted, on the one hand, with a new customer having a large order to place, which they desire to secure, while on the other hand the steam fitters throughout the country assert that this new customer is primarily a builder and not entitled to purchase goods in their line. This question is not an old one, and at present it is confined almost wholly to the large cities; but it is likely to affect the interests of the steam fitters wherever such construction companies take contracts for the erection of large buildings. The steam fitters claim that the manufacturers will lose nothing by living strictly up to the principles of trade protection, as the goods will eventually come from their hands. On the other hand the large construction companies are reluctant to purchase from middle hands such large quantities of material as they require. Meanwhile the question has been the subject of discussion at a number of trade conferences, and there is said to be a prospect of adjustment that will be satisfactory to all concerned.

The Barometer of the Iron Trade.

Under prevailing circumstances the condition of the iron trade is best reflected by the developments in that branch of it which concerns itself with foundry pig iron. The reason is obvious. On the one side we have a very large number of producers absolutely independent of one another, and on the other there are over 4000 consumers, large and small, whose work touches a vast variety of general consumptive requirements. In the steel trade and in nearly all branches of the rolling mill industry there has been such a concentration of interests that it is not usually an easy matter to gauge actual conditions. Events have their free play in the foundry iron trade.

A good deal of anxiety has been displayed lest the iron industry be overtaken by another "boom period," and manufacturers generally show a disposition to apply the brake in order to head off such a contingency, which is regarded as dangerous. A study of the situation in foundry pig iron does not indicate that it is imminent. Both consumption and production are on a very large scale and the position is exceptionally strong. A moderate upward movement has taken place and purchases have been made far into the current year, but there seems little danger of a buyers' scare, which, after all, is the cause of booms. Additional capacity is being prepared for work, which will aid in augmenting the supply.

New Publication.

LIGHT, HEAT AND POWER IN BUILDINGS. By Alton D. Adams, member American Institute of Electrical Engineers. One 12mo vol.; cloth; 102 pages. Price, $1. New York: W. T. Comstock.

This book is intended as a convenient manual on the subjects treated, its object being to present in compact form the main facts on which selections of the sources for light, heat and power in buildings should be based. In the discussion of the subject questions of economy and efficiency are very fully discussed, and the requirements of equipment to suit different conditions. While scientific theories are referred to, the purpose is rather to make practical suggestions that will be applicable in actual practice than enter upon theoretical discussions as to the merits of various classes of apparatus. The feature of special interest in the work and its main novelty, that of arrangement by cost of service from widely different sources, are set down side by side. This feature of this work is one that will be appreciated by all who wish to study up the essential features of plants of this character. It will be found a useful and ready reference for such purposes.

The contract for the power plant of the Louisiana Purchase Exposition, at St. Louis, has been awarded to the Westinghouse Electric & Mfg. Company of Pittsburgh. This plant is to be of 10,723 horse-power. It will be the largest single plant ever put into an exposition and will be located in Machinery Hall, where it is to form one of the exhibits. The directors of the exposition propose to use between 25,000 and 30,000 horsepower for lighting and power purposes in the exposition. The power above that supplied by the Westinghouse plant will be supplied by St. Louis electrical companies.

OAK STOVES.

At recent meetings of the various associations of stove manufacturers the oak stove has occupied a considerable portion of the time devoted to discussion. Only a short time ago the idea that the oak stove was supplanting the handsome square parlor heater would not have been considered as reasonable by the trade. There is a firm conviction to-day, however, that if it has not supplanted the square parlor heater the oak stove has at least filled the larger portion of orders which the manufacturers have received for heating stoves. This has led to an investigation of some of the interesting conditions surrounding this type of heater. To look the situation fairly in the face, the oak stove is recognized by the general public as giving more heat in proportion to cost than some of the old favorites.

Originally the oak stove made no pretense to beauty or finish, and it not only survived its introduction, but grew into popular demand through sheer force of merit. In comparison with the modern parlor heater it suffered much in appearance from lack of finish and ornamentation. Here, it may be said, the trouble began. The oak stove has not changed in price to correspond with its change in appearance. In many instances the original price holds practically the same. When the first nickel trimmings were added they were of comparatively small cost and the additional expense was hardly felt. But as the nickeled base and feet followed the nickeled foot rails and nickeled pilasters accompanied the nickeled rings, necessitating the handsome top ornament, with all of the other trimmings embellished in correspondence, the necessity for a change in price became urgent. The manufacturer now not only has to face a loss on the patterns of his old time favorites through their reduced sale, but also a margin of profit on the oak stoves which have supplanted them so narrow that a valuable source of revenue is no longer available.

This history, even if it may need correcting, is only another instance in which the public have profited by the failure of manufacturers to protect their own interests. The recent advances in iron are known to everybody, but the advances in the price of nickel bands, nickel trimmings and top ornaments, and other small items which enter into the construction of a stove, although of greater effect on the total cost, are known only to the manufacturers. While the buyer seldom has consideration for the seller, it would seem that the time was approaching when the buyer of oak stoves should be willing to afford the manufacturer a fairer return for his enterprise and labor in the production of this now quite generally popular stove. Already, in some associations, an advance in price of 10 per cent. has been made, and it may be naturally expected that this advance on oak stoves will become quite general.

ADVANCED STOVE PRICES IN THE WEST.

The Western stove manufacturers have advanced the price of steel ranges 10 per cent., and of cast ranges 5 per cent. As far as known the advance on heaters has not been definitely settled, and the new price on these goods may not be fixed until nearer the time when orders will begin to be placed for next season's trade. It is not expected that much will be done in the sale of heaters the remainder of this winter, as the trade is undoubtedly pretty well supplied. Such sales as now occur are of a scattering character, and usually represent the wants of some belated buyer confronted by an emergency which compels him to purchase a stove.

The advance made in cooking goods is stated to have been received by the dealers without much objection. They recognize the fact that costs have advanced, as they are familiar with the high prices now ruling on the materials from which ranges are made. The demand is not heavy at present, but both in Chicago and in the rural districts tributary to the city a fair amount of business is doing, which is fully up to the usual movement at this time of the year. Some of the stove houses are reporting a better trade than they enjoyed at the corresponding time last year. All branches of business are in such good condition that wage earners are well employed and families are consequently seeking houses for which they must have furniture.

WHAT SHOULD A FURNACEMAN KNOW?

BY J. K.

We have for some time past been very much pleased, and not a little benefited, by the many good things that our "warm air" brothers have been serving up to us through *The Metal Worker*. It is indeed evident to us that warm air still lives and moves, although sometimes in a mysterious way.

In reading over a Philadelphia contributor's article on "What Should a Coruice Maker Know?" we wondered to ourselves "What Should a Furnaceman Know?" Notwithstanding the volumes that have been written on giving every furnace a plentiful supply of cold air we still find many so-called furnacemen who seem to be of the opinion that cold air is altogether too expensive a luxury for common, every day use.

This fall we had occasion to take down a church furnace that was erected in the fall of 1899, and after two years' use we found the poor thing entirely burned up, with holes in the fire pot and radiator that you could put your fist through. In fact, the ash pit was the only part that remained intact. Upon examination to find out the cause of this we discovered that this furnace was intended to supply two warm air pipes of 16 inches diameter each, and two more of 12 inches diameter each, or a total area of 628 square inches in the warm air pipes. To supply this there was a small hole under the furnace, having an area of about 50 square inches, and even this had no connection with the outside. Is it any wonder that this poor heater became thoroughly worn out in the unequal struggle to save its reputation as a producer of fresh warm air?

We can also tell of other cases very similar to the above, and we again say What should a furnaceman know? or, How can this sloppy and ignorant mode of erecting heaters be improved? as we fully realize that every improperly placed apparatus is an injury to all engaged in the trade by making the consumer thoroughly disgusted with the whole heating business.

Then, again, we have the evil of small warm air pipes to contend with, and the running of wall stacks up on unprotected outside walls. We know of one job under course of construction where one pipe 3 x 10 inches is supposed to heat a parlor 16 x 16 feet and a chamber above of the same size, each having an almost solid glass front and two exposed walls. Now why will so-called "furnacemen" continue to do this, when a little common sense should teach them better?

Our idea of placing any warm air heater is: 1, To set our mind on some good heating apparatus; then to be sure to get it large enough to have some surplus strength left, even on the coldest days; 2, have backbone enough to secure for this a good central location, so as to equalize the run of pipes; 3, to make all pipes of ample size with easy turns. Then further, do not on any account use two-piece elbows, or connect round pipe to stacks without the use of some good style of boot or starter. This is very important, as we have seen otherwise well constructed jobs spoiled by running pipes into the sides of narrow stacks. Abolish the old, cramped, shallow, contracted register box and use the improved hopper style. They are just as easily made and take no more stock, have no dead corners to gather dirt and allow the air to flow more freely. Last, but not least, do not forget the cold air supply. Do give the poor hard working heater plenty of fresh air to breathe, poor thing. It will get plenty of abuse and hard usage after you have left it to its work and fate in the cellar, without denying it the very necessity of its life—air.

MICHAEL BARD, who represented the Triumph and Etna lines of Stoves and Ranges for the Pittsburgh Stove & Range Company, has resigned to accept a position with the Prizer-Painter Stove & Heater Company. Mr. Bard will be attached to the company's Pittsburgh office, which has recently been opened under the management of Charles W. Goodnough.

THE ASTOR HOUSE STOVE ASSOCIATION?

Having recognized the demoralizing effect on the general stove trade of making New York City a place for open competition, the influence of the stove manufacturers in other sections has probably been the cause of the reeent visit to New York of Secretary Hogan of the National Association of Stove Manufacturers. Evidently his influeuce has been suceessful in inducing manufacturers in the East to meet for the purpose of endeavoring to remove the unsatisfactory conditions. Under date of January 18 a call signed by President H. T. Richardson of the old association was sent out by the secretary, W. J. Myors, for the principals of interested stove manufacturing concerns to meet at the Astor House, New York City, on Thursday of this week to consider the reorganization of the old assoeiation, or to form a new association on somewhat different lines.

The result of this call was a fair attendance at the meeting of the manufacturers interested in the trade in this section. The condition of the trade in New York and immediate vicinity and the relation of the different manufacturers to it was thoroughly discussed. This resulted in the appointment of a committee for the purpose of devising some plan for reorganization of the association on new lines that will be acceptable not only to the members of the old association, but to those who had withdrawn from it, or had refused to join in the work it was engaged in. The commlttee have a difficult task before them, and those who are invited by its members should accord them a full hearing and give a generous consideration, if not aetive assistance, to the plans that may be presented. The work is in the interests of the whole trade, and is worthy of its co-operation. This movement, lf suceessful, will be followed by an advance in prices in this section, in line with the advances that have been made by the various associations in other parts of the country.

The Unique Fire Place Damper.

Robert Jahn, Scotch Plains, N. J., has been awarded a patent on the fire place damper invented by him, and whlch he is manufaeturing and selling under the name of Unique. Thls damper is of novel form, in that the frame is made in several pieces, so that it can be readily taken apart and put in the chlmney throat by sections with little labor in a short time. When operated with wood fires no smoke will enter the room, but the construction of the damper deflects the heat downward and into the room. The damper can be regulated with ease by means of a regulating rod even when a fire is burning; and it has no hinges or slides to rust or become clogged. It can be plaeed easily ln any fire place already built without cutting or damaging the front, and the work can be done by any ordinarily intelligent mechanic. The damper is claimed by the manufacturer to provide a perfect means of vontilating a room, whlle securing econemy of fuel with the maximum of heat. The dampers are made in nine sizes, with frames of 27 x 12, 30 x 13, 33 x 13, 35 x 13, 40 x 13, 30 x 16, 33 x 16, 35 x 16 and 40 x 16 inches dimensions.

The Alaska Stove Trimmings.

The Troy Nickel Works, Albany, N. Y., are sending to the trade a 56-page catalogue devoted to the Alaska goods manufactured by the concern. The front and back covers are finished with a pleasing color effect, showing a cake of ice in which the words "Alaska Stove Trimmings" and the address of the house are carved. An Alaska cover lifter and an Alaska oven door handle appear to be frozen in the eenter of the ice cake. This is the nineteenth annual catalogue of the house. The goods shown begin with tea pot handles and screen door handles, followed by the Troy damper for hot or smoke pipe and clips for sheet iron dampers. Several pages are devoted to fire sets for kitchen and parlor use, followed by Alaska fire shovels, pokers and cover lifters, shown in various styles. In the next seetion are presented Alaska soldering iron handles, ice picks, saucepan handles, kettle ears and kettle bails. Alaska turnkeys for sheet iron ovens, Alaska stove knobs, turnkeys and oven door handles in great variety occupy the next 20 pages, some of the trimmings being especially adapted to steel ranges. Hinge plus, malleable turnkeys, damper slide knobs, turnbuckle tongs and flue stop keys are followed by a variety of ornamental stove urns. The last pages are occupied by stove bolts.

The Ohio Valley Stove Association.

The third annual meeting of the Ohio Valley Stove Association, held at the Washington Hotel, Portsmouth, Ohio, on January 9, was opened by a banquet tendered by the Portsmouth contingent. The principal outcome of the business meeting was the adoption of the following announcement: "Owing to the continued advance in raw material going into the make up of stoves and ranges, we withdraw all quotations." This notice was ordered to be sent by all members to the dealers. There was no election of officers at this meeting. The next meeting will be held in Columbus, at the call of President J. D. Foster, president of the Foster Stove Company of Ironton, Ohio.

Mr. Foster was unable to be in attendance at the banquet which preceded the meeting, and in his absence Mr. Hertenstein acted as toastmaster in a very happy manner. After the elaborate *menu* was disposed of the following speakers responded to the various toasts: Frank V. Knauss of the Portsmouth Stove & Range Works, Robert Bryan, secretary of the Portsmouth Stove & Range Works, who responded to "The Ladies," and Thomas J. Hogan, secretary of the National Association of Stove Manufacturers, who praised the hospitality of the hosts, and spoke of the flourishing condition of the industry throughout the United States. L. W. Baker, vice-president of the Portsmouth Stove & Range Works, made a pleasing address, and Henry F. Bertram of the Ohio Stove Company recited several of Ezra Kendall's stories.

The following is a list of the guests who were present: L. E. Marting of the Foster Stove Company, Ironton; R. T. Thompson of the Gallipolis Stove Company; George D. Gibbons and Sherman W. Gibbons, Zanesville; Mayor Milstead; J. R. Clare, Henry Bertram, E. S. Clare and Washington Kinney of the Ohio Stove Company; John B. Knauss, F. V. Knauss, L. W. Baker, R. G. Bryan and R. E. Calvert of the Portsmouth Stove & Range Works; J. G. Niell of the Niell Stove Company; Thomas L. Bell of the Bell Stove Works, Gallipolis; R. Johnson, Bellaire, Ohio; T. J. Hogan, secretary of the National Stove Association, of Chicago, and A. Winsor of the Marietta Stove Company.

STEEL RANGES.

The most interosting question with the manufacturer of steel ranges at the present time is the price of these goods. During the past year the cost of producing steel ranges was very much increased by conditions over which the manufacturers had no control; and, in consequence, the impression prevails that the business was done at a very small and unsatisfactory margin of profit. Even those manufacturers who took a correct view of the future and attempted to protect themselves by laying in a stock of steel sheets suffered as well as their competitors who showed less forethought. The scarcity of steel sheets made it impossible to get deliveries of stock as promptly as desired, or in quantities that were satisfactory. During the latter part of the year many concerns were foreed to buy the necessary sheets wherever they could be picked up in the market at a price that is said, in many instances, to have involved a loss on the orders filled. Throughout the country, wherever the manufacturers have met, there has been evidence of a strong disposition to advance prices on these goods, so as to stop at least any loss. From some quarters there are already reports of an advance of 10 per cent. in prices. Through the energy that was expended on the introduction and sale of steel ranges last year many retail stove dealers throughout the country have built up a trade, and are

now having a considerable demand for these goods. In order to proteet themselves, these dealers should mark the steel ranges which they have in stock with the higher prices that they will be forced to ask on the new goods they buy to replace the ranges sold. Such actlon can also be taken with advantage on oak stoves, for it is reported that oak stoves have also been advanced 10 per cent. in many localities, owing to the lncreased cost, not only of the steel, but of other materials entering into their construction.

ODD PLATES.

The Wrought Iron Range Company of St. Louls, Mo., at their annual meeting this week elected officers and directors as follows: H. H. Culver, president; W. L. Culver, first vice-president; W. T. Moore, second vice-president; B. B. Culver, secretary; E. R. Culver, treasurer, and R. F. Bradshaw and Martin Collins, with the above, directors.

The Kelsey Heating Company of Syracuse, N. Y., are sending out a calendar bearing sectional views showing the construction of the Kelsey Warm Air Generator. An attractive feature of the calendar is a handsome portrait in colors of a charmlng brunette, entitled "Carnation."

W. P. Millar, who has filled the position of manager of the Stove and Furnace department of the James Smart Mfg. Company of Broekville, Ontario, Canada, for the past six years, will sever his connection with the company on February 15 and proceed to Shanghai, China, where he has been offered the position of superintendent of agencies for the China Mutual Life Insurance Company. Mr. Millar was instrumental in introducing the Kelsey Warm Air Generators to the Canadian trade in 1896, since which time these Generators have been successfully placed in all parts of the Dominion from the Atlantic to the Pacific.

The plant of the H. Wetter Mfg. Company of Memphis, Tenn., was visited by a fire on the nlght of Sunday, January 19, which practically destroyed the works. The loss is reported as heavy, but fully covered by insurance.

The Union Stove Repair Company, 2852 and 2854 Archer avenue, Chicago, are endeavoring to secure a building better adapted to their increasing business. The company enlarged their quarters during the past year, but the continued growth of their trade necessitates further expansion. They attribute this gratifying condition of affairs to their making a specialty of furnishing "orlglnal" Stove Repairs. A. A. Lamoreaux is president of the concern and O. J. Allison is secretary and treasurer.

At the recent meeting of the Lebanon Stove Works at Lebanon, Pa., the following directors were elected for the ensuing year: H. H. Kreider, F. E. Meily, H. A. Reinoehl, S. P. Reinoehl, A. W. Shultz, A. S. Light, A. A. Reinoehl and John H. Seltzer.

It is expected that the Kalamazoo Stove Company of Kalamazoo, Mich., will have their works in full runnlng order the latter part of February. We understand that it is the intention of the company to sell their product directly to the consumer instead of through the medlum of dealers, and they will therefore dispense with traveling salesmen, it being their intention to advertise extensively in newspaper and other mediums in order to bring their business promlnently before the public.

At a meeting of the Board of Managers of the Penitentiary of the State of Ohio a five-year contract was closed with the Pioneer Stove Company of Columbus, Ohio. The contract calls for the services of 90 men and a substantial lncrease ln wages to be paid to the State.

The Cortland-Howe Ventilating Stove Company of Cortland, N. Y., have begun to dismantle their works. The plant is to be moved to Royersford, Pa., where the concern will in future carry on the business of Stove manufacture. The company, of whom William H. Clark is manager, were organized in 1887, and until the latter part of 1888 their Stoves were manufactured in Fulton. At that date the work was taken to Cortland. At one time about 70 hands were employed, but for the last few years the force has been gradually reduced.

It was announced a year ago that the Scranton Stove Works of Scranton, Pa., would share the profits of the business with their employees, and in accordance with this plan the company on January 17 dlvided something like $4000 among the 165 men which they employ.

Terstegge & Gohmann of New Albany, Ind., enjoyed a very gratifying volume of business during the year just brought to a close. The large plant of the concern was in steady operation, giving employment to a considerable force of hands. The outlook for the new year is most encouraging, and we understand that the volume of business for the first half of the present month exceeded by a large margin that of the correspondlng period of last year.

The Stove trade will regret to learn of the sudden death on January 16 of Otto Germer, Sr., of the well-known firm of Black & Germer of Erie, Pa. Mr. Germer was in his accustomed health in the morning and attended to his business until noon, when he went home for his midday meal. A few moments after his arrival he was stricken and died before a doctor could be summoned.

At Pittsburgh, in the patent lnfringement case of H. Adler against the Adams & Donaldson Mfg. Company and Demmler Bros., a preliminary injunction was refused. A gas stove is involved. The court sald that the questions involved should not be determined at this preliminary stage, and that it is the usual practice for motions for preliminary injunctions in cases in which the patent had not been sustained to go to a final hearing. The suit now goes on the regular trial list.

Owing to the famine ln coke the McClary Mfg. Company, London, Ontario, Canada, have not yet started up the Stove works in Hamilton that they purchased from the Copp Bros.' Estate. The foundry may be started in a short time, however, if the necessary fuel can be got.

The Cook & Van Evera Company, 38 Lake street, Chicago, have been appointed Northwestern sales agents for the Twentieth Century Furnace. A soft coal Furnace was needed for their trade, and this Furnace was selected as meeting the requirements desired.

The American Tube & Stamping Company.

The Wilmot & Hobbs Mfg. Company gave notice that they have sold out as of January 1 their entire business and property, subject to the liabillties, to the American Tube & Stamping Company of Bridgeport, Conn. This year the new company will be making Swedoh steel billets in their new open hearth furnaces and blooming mill, and possibly large steel castlngs, thus assuring an adequate supply of raw material. In the press and stamping business they contemplate continuing the policy of refraining from competing with the customers of thelr rolling mill department. The officers of the eompany are: Frank A. Wilmot, president and treasurer; Albert N. Stanton, vice-president; Clarence D. S. Miller, second vice-president; Henry W. Nutt, secretary, and Albert J. Middlebrook, assistant treasurer.

The dam now being constructed for New York's water supply will, when finished, be the largest in the world. It will form a reservoir 19 2-3 miles long, fed by a water shed of 373 square miles. The water will submerge the old Croton dam 34 feet, put farms and houses, now tenanted 50 feet or more under the flood and increase the present avallable storage capacity of Croton Lake from 2,000,000,000 to 32,000,000,000 gallons. New York will then have in all the reservoirs of the Croton water shed about 74,500,000,000 gallons of water in storage as protection against drought. After the new dam is completed it will take five years to fill the reservoir.

A. W. Payne has succeeded Payne Bros. in the Hardware, Stove and Sporting Goods business in North Salem, Mo.

THE TEMPORARY WARMING OF THE LARGE HALL OF THE PALACE LIBRARY, VIENNA, AUSTRIA.*

BY PROF. EDWARD METER OF THE IMPERIAL TECHNICAL HIGH SCHOOL, VIENNA.

Translated from the German by Charles F. Hauss.

The subject that I am about to submit to you to-day may not be of very great importance and may not occur under the same conditions again, yet it seems to me to be so unusual, owing to the peculiar conditions and method of handling, as to be worthy of your attention.

The hall is the large book room of the Imperial Court Library, designed by Court Architect Fischer von Erlbach and finished about 1736. The walls are all covered with costly shelving made of rare woods, and filled with priceless books and manuscripts, the ceiling is beautifully frescoed and the floor is made of mighty slabs of stone.

This hall had never been artificially warmed in its nearly 200 years of existence, and when you know that the order to heat it came only a few days before the intended reception, and during the cold season of the year, for such a select gathering, you will have some idea of the task set for us.

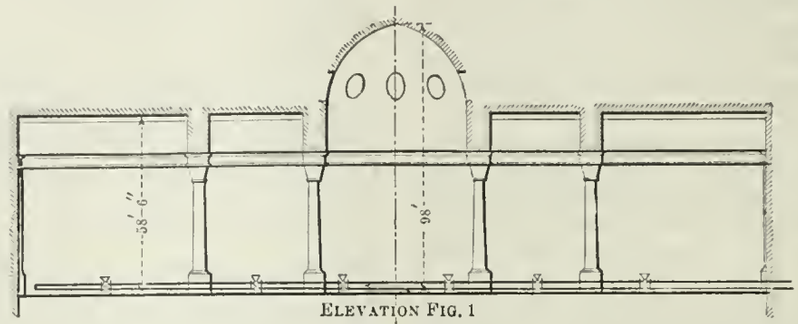
Figs. 1 and 2 show a sectional elevation and plan of the hall. It was a sudden idea of the Court Marshal, placed in the front rank of the programme, that the Austrian Emperor should lead his young and ambitious guest, Germany's Crown Prince, through the grand library hall to show him some of his priceless treasures. Naturally a great deal of thought was given to properly carry out this idea.

The greatest difficulty was to install the heating apparatus, the order for which was given about the end of March. The weather was cool and variable, and the reception was to take place on April 14.

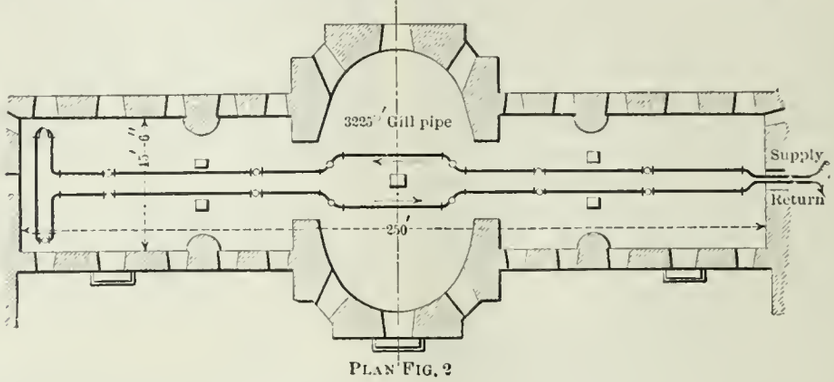
Now we knew that in former years the hall seldom had a temperature of 50 degrees F. even in May, when the attendants entered it wearing overcoats.

A personal survey showed at once the many difficulties in the way; the book covered walls forbade the setting up of radiators, and the fact that all the rooms under the hall were filled with books prevented the introduction of heat through the floor. Added to this was the anxiety of the Library Direction that a sudden change in temperature and moisture of the air in the hall might have a bad effect on the wood work, books and bindings, which was anything but encouraging and urged on us the greatest care. There was no thought of erecting a permanent heating apparatus, owing especially to the lack of time.

One help in the solution of the problem lay in the fact that the end of a steam main that is part of the system for heating the new palace was not far away, and allowed us, with slight changes, to get steam at 39 pounds pressure. The method of using this steam was not long in doubt, for the first thing to impress the expert was the large stone floor space, with which the body must come in close contact.



ELEVATION FIG. 1



PLAN FIG. 2

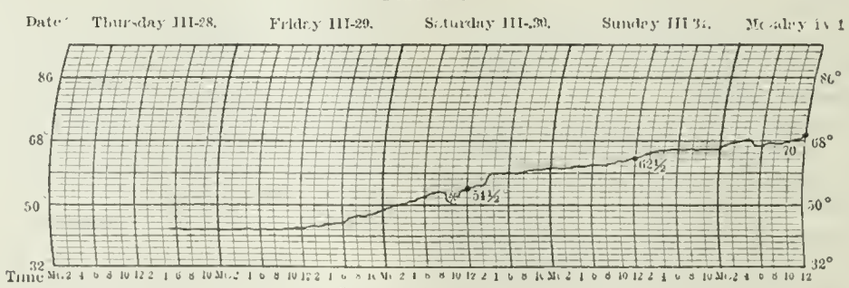
Fifteen minutes on this floor was enough to give one very cold feet, which great loss of bodily heat necessitated the giving of special attention to warming the floor.

This prompted the decision to distribute the heating surfaces as near the floor as possible and through the middle of the hall, and by a continuous heating of the space have the surrounding walls and floor absorb enough heat and store it, that they would give off again after the apparatus was removed, and leave the space warm enough on the day of the reception to make it safe for the imperial guest to spend some time in the hall.

For removing the heating apparatus, airing and decorating the hall three days were allowed, and it was determined that the temperature should at no time exceed 82.4 degrees F and that the usual relative amount of moisture in the air should be maintained.

The construction of the apparatus was intrusted to the firm of J. L. Bacon, in Vienna, and little time was lost before the work was commenced. The amount of heat necessary to maintain a temperature of 59 degrees F. in the hall when the outside temperature was 41 degrees F. was about 600,000 heat units per hour. The amount of radiation used in the work was 3225 square feet of gill pipe, or extended surface radiation, rated to

FIGURE 3



* Break in heating

* Paper read at the eighth annual meeting of the American Society of Heating and Ventilating Engineers, New York City, January 21-23, 1902.

give off about 800,000 B. T. U. per hour. The pipe was laid in two lines, as near the floor as possible, to allow for drainage in the two lines, which are together about 500 feet long. These gill pipes are shown in Fig. 8. The work was finished in the short space of three days and on March 28 at 5 p.m. steam was turned on.

The heat was maintained continuously day and night until April 7, after which, the temperature having reached the limit of 68 degrees F., the heat was only maintained for 12 hours each day.

At 6 o'clock a.m. on April 12 the heating apparatus was removed, and at 3 o'clock p.m. on April 14, or three hours before the reception, the doors and windows were opened to thoroughly air the hall.

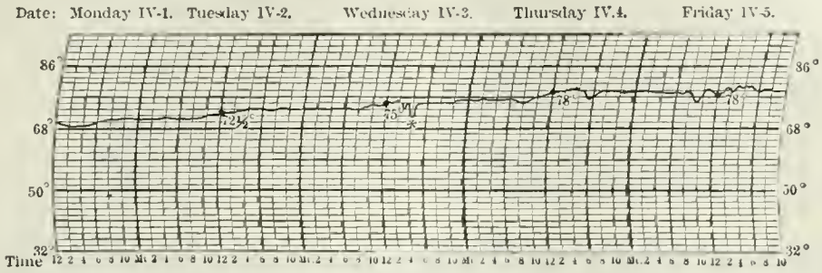
The record of temperature was kept by two registering thermometers, one on the floor, the other in the gallery. Figs. 3 to 7 show the record of the gallery thermometer.

It may be well to mark the rapid rise in temperature from the beginning of the time of heating—up to 69.8 degrees F.—and the much slower drop in temperature after the heat was shut off. Yet the increase as well as the decrease was gradual, and shows that the walls and floor did store the heat.

The diagram shows that on the day of the reception the inside temperature was about 68 degrees F. The average outside temperature was 47.3 degrees F. It is remarkable that the floor thermometer registered during the first period of heating from 2.2 to 3.6 degrees F. higher than the gallery thermometer.

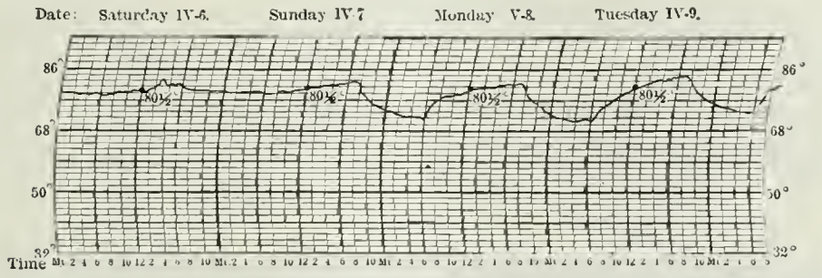
Aside from the observation of the space tempera-

FIGURE 4



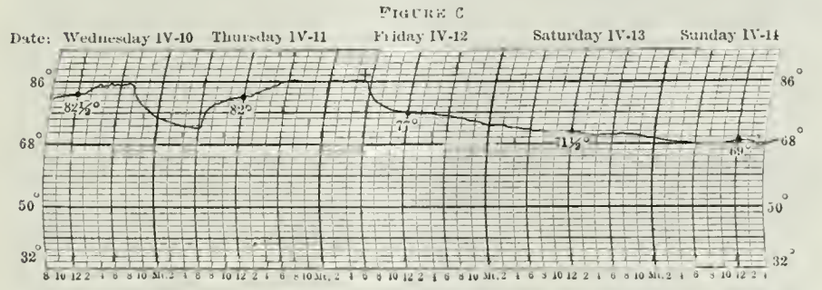
* Break in heating

FIGURE 5



NOTE- The Temperature marked inside the diagrams is the temperature at 12 o'clock noon of each day.

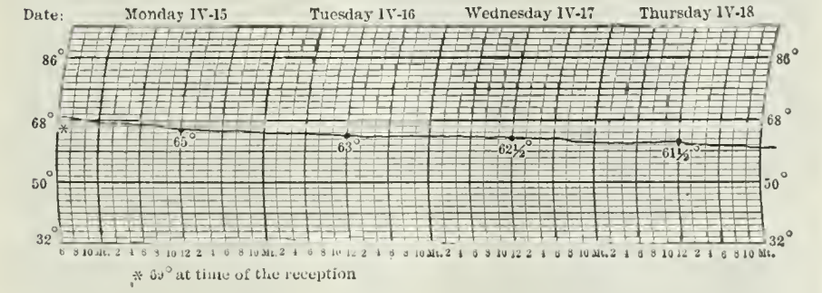
FIGURE 6



† End of period of heating

* Airing of the hall.

FIGURE 7



* 69° at time of the reception



FIG. 8.—CAST IRON GILL PIPE RADIATION USED.

The sections are 6 feet 6 inches long, with flanges, and have 42 square feet of surface per section.

tures we also made tests of the floor temperatures with quicksilver thermometers, that were set in bored holes 2¾ inches deep. This record is shown in Fig. 9, which also shows the relative position of the heating pipes and the position of the floor thermometers.

When heating was commenced, with an inside temperature of 42.8 degrees F., a relative moisture of 70

per cent. was contained in the air, which percentage was maintained throughout by 14 tin funnels filled with pebbles and attached with regulating valves to the steam pipes, and through which steam was allowed to escape. Fig. 10 shows this air moistener.

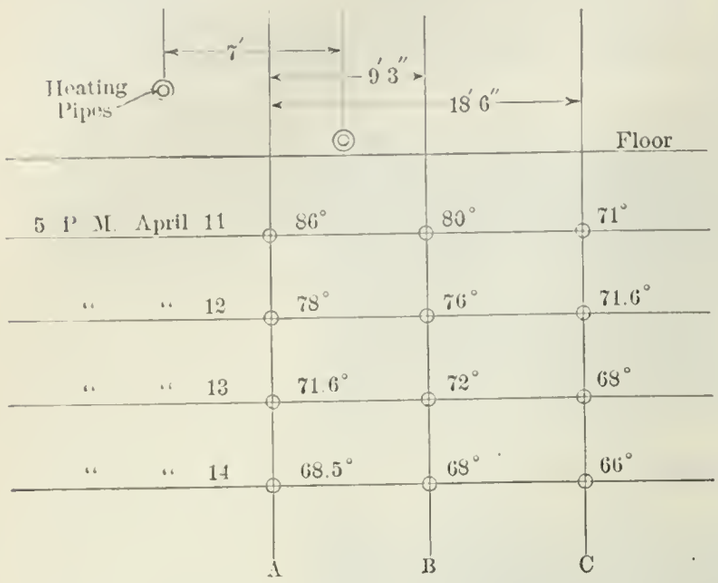


FIG. 9.—SHOWING RECORD OF FLOOR TEMPERATURES.

The heating pipes were placed 7 feet apart. The vertical line A is the thermometer between the pipes, line B the one 9′ 3″ from center, and line C the one placed 18′ 6″ from center of radiation.

The success of this arrangement was complete, the hall was heated to the proper temperature at the time of the reception and there was no injury to either wood work or books.

Fig. 11 shows an interior view of the hall when the heating apparatus was in, and gives a good idea of the general conditions.

The Joseph Dixon Crucible Company, Jersey City, N. J., give interesting information concerning the protective painting of the Union Railroad Bridge, which crosses the Monongahela River at Rankin, Pa. The total weight of this bridge is 5135 tons, and it has a total length of 2328 feet. Designed for carrying molten metal from the Carrie Furnace to the steel mill and raw materials to the furnaces, this notable steel structure is subjected to heat from the molten metal, sulphur fumes from locomotives and river steamers, also from the adjoining furnaces and steel mills. No other steel bridge in all the world is exposed to so many and severe destructive agencies. The best metal preservative was necessary, and the eminent engineers in charge of the work selected for its protection Dixon's silica-graphite paint, manufactured by the Joseph Dixon Crucible Company.

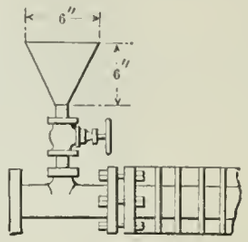


FIG. 10.—AIR MOISTENER.

A 6 x 6 inch tin funnel filled with pebbles, through which the steam from a ½-inch valve is allowed to reach the air.

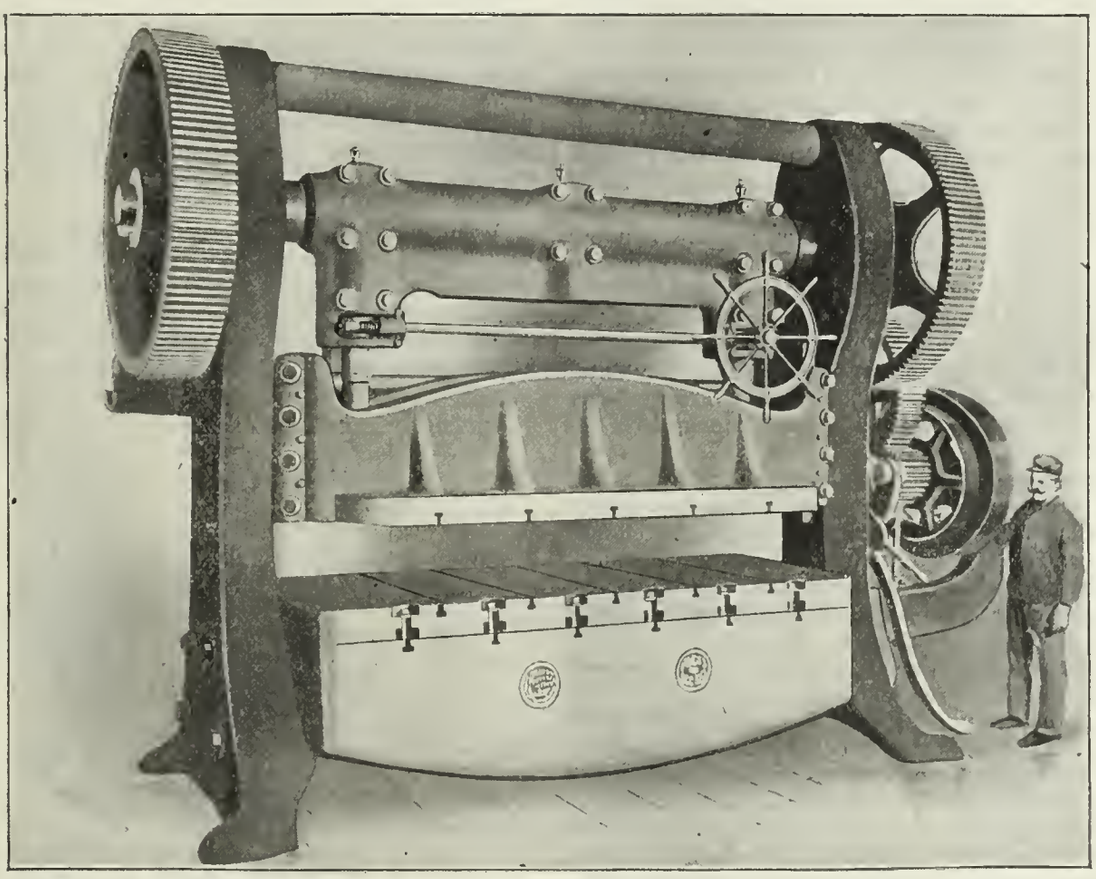


FIG. 11.—INTERIOR VIEW OF THE IMPERIAL COURT LIBRARY IN VIENNA.

A Large Ferracute Stamping Press.

The Ferracute Machine Company of Bridgeton, N. J., recently built an unusually large press from designs by Oberlin Smith. It is of the double crank type and embodies several features which are unique in machines of this class. There is an improved construction for the prevention of upward deflection in the long shaft between its journal bearings in the main housings. This is accomplished by extending the pitman casting continuously from end to end, instead of by putting additional bearings in a trussed beam connecting the top of the columns, as is usual. This arrangement simplifies the design in some respects, as it is always desirable to connect the pitmen, and the same casting, by making it front. A power attachment for this adjusting device can be provided, if desired.

The machine in question was especially intended for the embossing of steel doors, door frames, ceiling plates, wall plates and other ornamental architectural work. Its total weight is about 76,500 pounds, and it has been tested to over 400 tons ram pressure. The maximum working pressure, however, is assumed to be 300 tons, and it will take in a sheet of metal 10 x 4 feet, with allowance for clearance. Some of its various measurements are as follows: Hole through bed, 44 x 108 inches; distance in the clear between columns, 124 inches; hight from bed to ram, when up, 26 inches; standard stroke of ram, 4 inches; adjustment of ram downward, 10 inches; fly wheel, 40 x 7 inches, with a weight of 800 pounds, and a speed of 400 revolutions per minute; ratio of gearing, about 25, variable to 50, if desired; extreme hight from floor, 140 inches; extreme length from right to left, 208 inches; extreme depth front to back, 69 inches; bolster thickness, 6 inches.



A Large Ferracute Stamping Press.

somewhat deeper and stronger, will give as good an effect as is attained by the other method.

The machine is equipped with a new automatic friction clutch which, by a pressure on the treadle, causes it to make one stroke and stop with the ram up.

By a slight change of adjustment the machine may be worked by hand, the pressure of a single finger on the handle (shown at the right in front) sufficing to stop or start, and to bring the ram to any desired position. This can be done so delicately that the periphery of the main gears can be moved ⅛ inch at a time. A third condition of adjustment in the clutch allows for the continuous running of the ram. An adjustable brake is automatically thrown in when the driving friction is thrown out, and *vice versa*.

A feature, not common in presses of this kind, is the use of twin gears upon the main shaft, and twin pinions to drive them. This system is desirable for long shafts, where the hardest work may come near either end, as the torsional spring of the shaft is obviously much decreased. Moreover, each pinion, gear and main shaft journaled has only half as much work to do as is the case with the usual construction, with one large gear doing all the work from one end.

The gearing is all cut from the solid, the large gears upon the main shaft weighing over 1 ton each. The pinions are of steel. The adjustment of the ram, after slacking the pinch bolts upon the pitman stem screws, is performed by revolving the pilot wheel shown in

A Model Employer.

A marked characteristic of the late Christopher Zug of Pittsburgh, who passed away last week at the venerable age of 95 years, was the constant consideration he showed for his employees. It is said of him that there was no prominent manufacturer in America who had less contention with his workingmen than this Pittsburgh ironmaster. He not only regarded the rights of his employees, but he also entered to a large degree into their sympathies and aspirations, striving in every way for their material as well as their social and intellectual advancement. Mr. Zug was regarded as a strong friend of union labor, and the signature of Zug & Co. was always the first, or one of the first, to be attached to the Amalgamated Association wage scale. Such a thing as a serious dispute at the Zug mills was entirely unknown. Mr. Zug's death has called forth many expressions of regard and regret from the workingmen of the Pittsburgh district. It was eminently fitting, in view of the relations he held with them, that a number of puddlers from his rolling mills and other workingmen were selected to act as pall bearers at his funeral.

The Fred. J. Swaine Company's Sheet Metal Machinery.

A new illustrated catalogue of 84 pages in a neat cover has been issued by the Fred. J. Swaine Company, 930 and 932 North Main street, St. Louis, Mo., covering their line of power presses, swedging machines, foot presses, double seamers, drop presses, dies and special machinery for working wire and sheet metal. In the introduction the company state that since issuing their last catalogue they have made many improvements in the various lines they manufacture. The first part of the catalogue is devoted to open front power presses used in working tin and other light sheet metal in various shapes. In these presses the company claim to have embodied the best points of all other presses, especial care being taken to make them on as near a straight line principle as possible, securing the greatest rigidity of material to withstand the heaviest strains. All their presses are built to standard, and all standard tools can be used or exchanged from one press to another. The company's improved box cap grip is a feature of all their presses. Automatic feeds set to different requirements are also applied to the various presses. These presses are shown in a number of different styles suitable for all kinds of work in sheet metal, including punching, horning, embossing, wiring, stamping, crimping, swedging, doubling, seaming, bumping and finishing tools, designed to form light sheet metal articles in the quickest possible time. Each machine is fully described, together with information regarding its adaptability to different machines. The presses are made in sizes varying in capacity from a small can up to a 24-inch galvanized iron washtub.

Other machines included in the catalogue are power lifters for drop presses, Peck's patent drop lift, power forming rolls, crimping, beading and flanging machines, crimping, beading and trimming machines, foot forming and stamping machines, sheet metal oiling machines, gang and slitting machines and trimmers, and a variety of foot and arch screw presses. Foot power squaring shears, tin folding machines, grooving machines and wire forming machines occupy the last pages of the catalogue. The company state, in connection with the present catalogue, that the fact of the absorption of nearly all the leading can factories and the majority of the manufacturers of can making machinery into one large concern, together with the increasing demand for tin packages of all kinds, has made can making machinery in great demand. In the present catalogue they show that they have taken steps to meet this demand in the fullest possible manner.

New Tin Plate Mill at McKeesport.

The McKeesport Mfg. Company, recently organized, intend to build a ten-mill tin plate plant at Port Vue, near McKeesport, Pa. Plans for the plant are being drawn by S. Diescher & Son, consulting engineers, Hamilton Building, Pittsburgh. The buildings will be of iron and steel construction and the mill building will be 210 x 350 feet; tinning and assorting building, 50 x 600 feet; boiler house, 40 x 150 feet; electric plant, 40 x 60 feet, and warehouse, 40 x 100 feet. The new plant will have direct connection with the Pittsburgh & Lake Erie Railroad. Contracts for most of the machinery have already been placed and the concern hope to be making tin and terne plate by September or October. E. R. Crawford will be general manager and J. E. Lauck will be superintendent. Both of these parties have been connected with the Demmler Works of the American Tin Plate Company for some years.

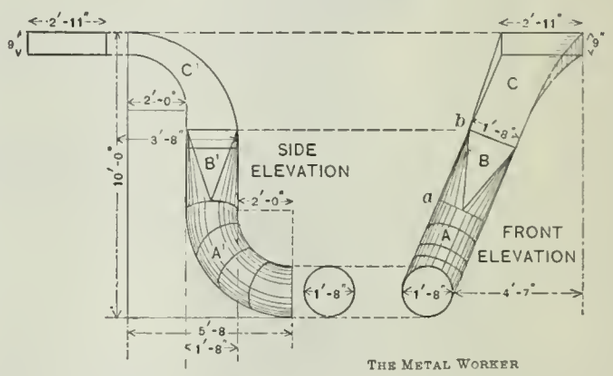
The Juniata Tin Plate Company, capitalized at $250,000, will build a Black Plate mill and Tin Plate factory at Greencastle, Ind. F. M. Strong, for several years manager of the Elwood plant of the American Tin Plate Company, has resigned that position to take charge of the new company. Associated with him are Samuel Lewis, William H. Richards, J. H. Seiberling and H. M. Strong.

Pattern for Twisted Transition Elbow.

A correspondent in Memphis, Tenn., submits the following inquiry: "I send herewith a drawing for some piping in a grain elevator and would be pleased to receive information regarding same through *The Metal Worker*. The connections must be made in the elbows and the flare on the side of the top elbow must be made all on one side, so as to pass the rafters in the building."

In Fig. 1 is shown a reproduction of our correspondent's sketch, showing the front and side elevations of the elbows and connections with the full size measurements thereon. By referring to the front elevation, which shows three different fittings, which we would advise our correspondent to use, A shows a pieced elbow, shown in side view by A^1. B is a transition piece joining the round elbow at *a*, shown in side view by B^1, while C is a twisted transition elbow, 20 inches square at *b*, flaring to one side, as shown, to connect with a pipe 9 x 35 inches, and is shown in side view by C^1. The pieced elbow at A is cut in the usual manner, while the transition B is developed as shown in "The New Metal Worker Pattern Book" on page 336.

What our correspondent evidently desires is the pattern for the twisted transition elbow C, and to avoid a confusion of lines, which would occur in so small a space, enlarged diagrams are shown in Fig. 2, in which 1 2 12 11 is the side of the elbow shown in front by 1, 2, 2°, 1°, 12° and 10. which represent similar shapes, as shown



Pattern for Twisted Transition Elbow.—Fig. 1.—Reproduction of Correspondent's Sketch.

by C^1 and C respectively in Fig. 1. The first step in Fig. 2 is to divide the two curves in side view into an equal number of spaces, as shown by the small figures 2 to 12 on the outer curve and 1 to 11 on the inner curve. At right angles to 1 2 in side elevation and from points 2 to 12 on the top curve draw horizontal lines intersecting the top of the elbow in front elevation at 2, 4, 6, 8 and 10 on the line 2 10, and at 2°, 4°, 6°, 8°, 10° and 12° on the line 2° 12°, as shown. In similar manner, at right angles to 1 2 in side elevation and from points 1 to 11 on the bottom of the elbow draw horizontal lines intersecting the bottom of the elbow in front elevation at 1, 3, 5, 7 and 9 on the line 1 9, and at 1° 3° 5° 7° 9° and 11° on the line 1° 11°, as shown. In this connection it should be understood that the corner or miter lines 2 10, 1 9 and 2° 12°, 1° 11° are drawn at pleasure after the dimensions are obtained; but when once drawn remain fixed lines.

For the pattern for the top of the elbow proceed as follows: At right angles to 2 2° in front draw the line 12′ 2′, upon which place the stretchout of the top curve 2 to 12 in side elevation, as shown by 2′ to 12′ on the line 12′ 2′. At right angles to 2′ 12′ and from the small figures draw lines, as shown, which intersect with lines, not here shown, drawn from points having similar numbers on the miter lines 2 10 and 2° 12° at right angles to 2 2° in front elevation, thus obtaining similarly numbered intersections in A. A line traced through the points thus obtained, as shown by 2 2° 12° 10, will be the pattern for the top of the elbow.

For the pattern for the bottom draw a line, 1′ 11′, at right angles to 10 9°, upon which place the stretchout of the bottom curve 1 11 in side elevation, as shown by

similar numbers on 1′ 11′. At right angles to 1′ 11′ and from the small figures draw lines, as shown, which intersect with lines, not here shown, drawn from points having similar numbers on the miter lines 1 9 and 1° 11° in front elevation at right angles to 9 9°, thus obtaining similar numbered intersections in B. A line traced through points thus obtained, as shown by 1 1° 11° 9, will be the pattern for the bottom of the elbow.

The patterns for the sides E and F will be developed by triangulation. As the method used for obtaining the pattern E can also be applied to F, only the side E will be developed. Now, from the various points in the side view connect lines 2 to 3 to 4 to 5 to 6, 7, 8, 9, 10 and 11, as shown by distances having similar numbers. At right angles to C D draw lines from the various points, as shown. Then take the various horizontal distances and place them on similar lines just drawn. For example, take the horizontal distance 2 3 and place it, as shown, from 3° to 3 in the diagram of triangles, and draw a line from 3 to 2°. In similar manner take the horizontal distance from 3 to 4 and place it, as shown, from 4° to 4 in the diagram of triangles and draw a line from 4 to 3°. In this manner obtain all of the triangles for the twisted side E. Then, using these triangles and the patterns for the top and bottom, whose miter lines show the developed lines for the corners of the elbow, we are

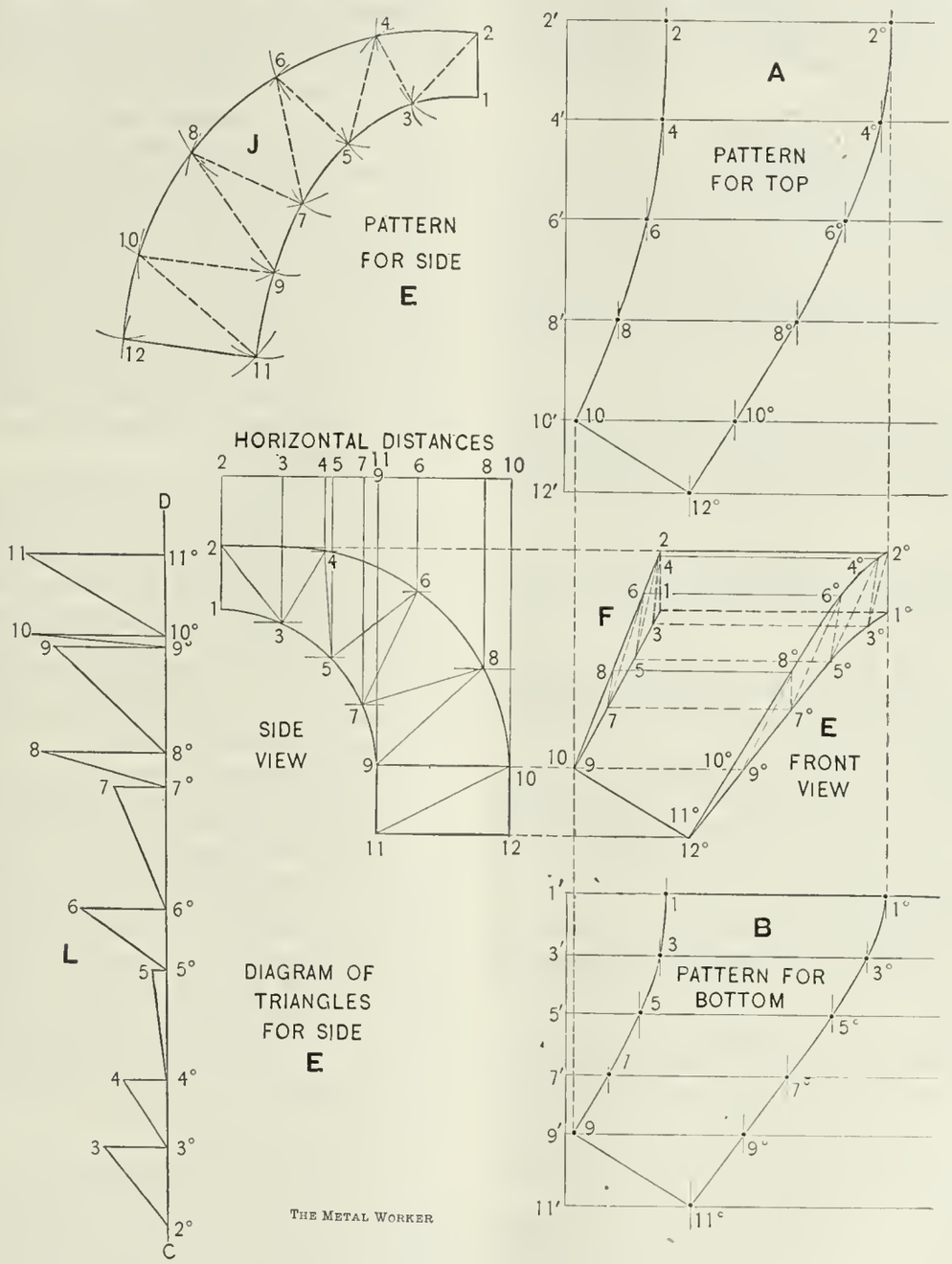


Fig. 2.—Side and Front Views, Diagram of Triangles and Patterns.

as shown. In similar manner, in the side E in front connect points 2° to 3° to 4° to 5° to 6°, 7°, 8°, 9°, 10° and 11°, as shown, and proceed in the same manner for the side F by connecting 2 to 3 to 4 to 5 to 6, 7, 8 and 9, all as shown. Then will the lines shown in E and F represent the bases of the triangle which will be constructed, and the horizontal distances between the points in the side view the altitudes or hights. To obtain these horizontal distances in the side view draw any horizontal line, 2 10, on which erect perpedicular lines drawn from the various points in the side view, as shown, thus obtaining similarly numbered figures on 2 10 corresponding to those in the side view. For the diagram of triangles for E erect any line, as C D. Now take the various distances in the dividers in the side E, as from 2° to 3°, 3° to 4°, 4° to 5°, 5° to 6°, 6° to 7°, 7° to 8°, 8° to 9°, 9° to 10° and 10° to 11°, and place them on the line C D, ready to strike out the pattern for the twisted side E in front. Thus, in J draw any line, as 1 2, equal to 1° 2° in E. Now with 1° 3° in B as radius and 1 in E as center describe the arc 3, which intersect by an arc struck from 2 as center with 2° 3 in L as radius. Now with 2 in J as center and 2° 4° in A as radius describe the arc 4 in J, which intersect by an arc struck from 3 as center and 3° 4 in L as radius. Proceed in similar manner for the balance of the pattern, using alternately, first the divisions on the miter cut 1° 11° in B, then the proper numbered slant line in L, the divisions on the miter cut 2° 12° in A, then the proper numbered slant line in L, until the last line, 11 12 in J (which is obtained from 11 12 in the side view), is obtained. A line traced through points thus obtained, as shown by 1 2 12 11 in J, will be the pattern for the side E. In precisely the same manner obtain the pattern for side F.

Shaffer on Strikes.

A mass meeting of members of the Amalgamated Association of Iron, Steel and Tin Plate Workers was held in Youngstown, Ohio on Sunday afternoon, January 19. Members of lodges in the Mahoning and Shenango valleys were present, and the principal address was made by Theodore J. Shaffer, who is president of the Amalgamated Association. In referring to the strike of last summer, which ended in a disastrous defeat for organized labor, Mr. Shaffer said: "I am opposed to strikes, and declare to-day that in the one last summer both sides got more than they wanted, and there will not be another." Mr. Shaffer said that when the strike started the association had $72,000, had paid $200,000 in strike benefits and at present there was a balance of $100,000 in the treasury.

FLASHINGS.

The annual meeting of the American Tin Plate Company was held in Jersey City, N. J., on January 21. It was stated that only routine business had been transacted. The company announce that they cannot take any more orders for January delivery. Many mills, the erection of which was begun last year, are nearing completion and this will shortly increase the company's capacity.

Joseph Hilton has resigned as superintendent of the Cambridge Rolling Mill of the American Steel Sheet Company and the mill is now under the general management of Alexander Robins. It is expected that the Cambridge Rolling Mill will start up in about a week or ten days.

It is reported that the American Tin Plate Company are contemplating the dismantlement of their plant at Atlanta, Ind. It is said that the Atlanta mill may be removed to Elwood, Ind.

The building of the new plant of the Ohio Mfg. & Galvanizing Company at Niles, Ohio, is proceeding steadily and it is expected that the works will be in operation within a short time.

The incorporators of the Cadwalader Tin Plate & Metal Company, who will apply for a charter on January 28, are George A. Cadwalader, Joseph Cowley, H. Good, Samuel Hunt, Charles A. High and H. S. Loughrey. The company propose to manufacture Iron and Steel Sheets and Tin Plates.

The Springfield Cornice Works have secured the contract for the Metal Work on a new block which is being built on Essex street, Springfield, Mass., for Edward Radding.

It is understood that the American Can Company propose to follow the policy of gradually centralizing their factories, thereby curtailing expenses and promoting efficiency of manufacture. By April 1, it is said, their 60 plants will have been reduced to 45 by the closing down and dismantling of some of the smaller and less favorably located factories.

The old Niedringhaus rolling mill of the National Enameling & Stamping Company in St. Louis, Mo., the destruction of which by fire was reported in our last issue, will be replaced by a modern steel structure, work on which will be begun as soon as the debris of the old plant can be cleared away. The mill that was burned was the oldest of all the mills of the former St. Louis Stamping Company, having been built in 1879. The fire was caused by the boiling over of a grease pot, and the building, a wooden structure, 120 x 180 feet, covered with corrugated iron, was totally destroyed, involving a loss to building, machinery and stock of about $75,000, fully covered by insurance. It was with difficulty that the plant of the Buck's Stove & Range Company, adjoining the mill, was saved from catching fire also.

The G. Drouve Company, Bridgeport, Conn., have taken the contract for the Galvanized Iron and Copper Work on the new Meigs Building in that city. They have just completed the Cornice for the large Taylor Building.

The Wheeling Roofing & Cornice Company, Wheeling, W. Va., are said to be preparing to build a large plant at New Martinsville, W. Va., and to remove their Wheeling establishment to that place.

The Edwards Mfg. Company, Cincinnati, Ohio, have increased their capital stock to $20,000, and are now manufacturing at their Cincinnati plant a complete line of Conductor Pipe, Eave Trough, Wire Hangers, &c. The company's plant in Covington is given up to the manufacture of Ornamental Stamped Work, Cornices, Statuary, Zinc, Copper and Spun Work. The company report an excellent demand for their product. The office of the company is now located at 119 Lyceum street, Cincinnati, Ohio, where E. W. Edwards, the president and treasurer of the company, makes his headquarters. Mr. Edwards was formerly connected with the Reeves Mfg. Company of Canal Dover, Ohio.

The Newport Rolling Mill Company, Newport, Ky., are completing the plan of the three new finishing mills and two cold rolling mills, which they expect to have in operation about the middle of next month. With the installation of this additional machinery the company will be able to roll Steel Sheets of sizes from No. 10 gauge up and as large as 42 inches wide and 120 inches long. The mills of the concern have been running steadily for the past year and they are full up with orders covering the first quarter of 1902. So large has been the demand for their product that they have been obliged to turn down a considerable number of orders in their roofing and corrugating departments during the past three months.

Theodore Pratt of the Sheet Metal department of the Canfield Supply Company, Kingston, N. Y., has gone to Belgium on a visit to his old home, after an absence of ten years. While abroad Mr. Pratt will look after some matters of business for his employers.

Representatives of Amalgamated lodges and other labor organizations in the Wheeling district met on Sunday, January 19, to arrange for the national convention of the Amalgamated Association, to be held in Wheeling in April next. The Board of Trade of Wheeling will co-operate in providing finances.

It is reported that the Barrett Mfg. Company, New York, Chicago and other important cities, have absorbed their strongest competitor in the West, the Union Coal Tar & Chemical Company, Chicago. Well informed Chicago authorities are of the opinion that a large sum was cleared by the latter company on the transaction. It is also rumored that options are held on the other large competing plants in this line—that is, Tarred Roofing Felts and other Coal Tar products used in roofing and paving. If these plans are carried into effect it is quite possible that a sharp advance in goods of this character may be made. Manufacturers of Red Rosin Sized Sheathing held a meeting in New York January 21 and the presumption is that prices on this class of material will also be advanced.

The statement that the Youngstown Iron, Sheet & Tube Company, Youngstown, Ohio, makers of Wrought Iron and Steel Sheets and Pipe, Black and Galvanized, were rolling scrap from which to make Sheets to cover their buildings is incorrect. When their buildings were being erected they endeavored to purchase pure Puddled Iron Sheets free from scrap, but were unable to do so. Failing in this, they decided to make Puddled Iron Sheets in their own mills for covering their buildings. This concern will make a specialty of the manufacture of Puddled Iron Sheets for the open market free from scrap.

Several new lodges of the Amalgamated Association of Iron, Steel and Tin Workers have been organized in the Mahoning Valley district during the past week. A number of new Sheet mills have recently been started in the Youngstown district, and the new lodges have been formed among the employees of these new mills.

The Tucker Mfg. Company of Newark, Ohio, have incorporated, with $50,000 capital stock, to manufacture Black and Galvanized Steel Sheets into various products. John Tucker, O. M. Tucker, J. R. Tucker, Charles Kibler and Edward Kibler were incorporators.

The Eighth Annual Meeting of the American Society of Heating and Ventilating Engineers.

The opening of the eighth annual meeting of the American Society of Heating and Ventilating Engineers found a good representation of the membership in attendance. The meeting was called to order at 2.30 p.m. on Tuesday, January 21, at 12 West Thirty-first street, New York, by the president, J. H. Kinealy. On calling the roll, the following members were found to be present. In addition the meeting was attended by a number of others interested in its papers and discussions:

List of Members.

J. H. Kinealy,
A. E. Kenrick,
W. M. Mackay,
C. B. J. Snyder,
John Gormly,
S. A. Jellett,
A. G. Paul,
W. S. Washburn,
H. A. Joslin,
Newell P. Andruss,
Henry B. Gombers,
Charles R. Bishop,
Frank K. Chew,
W. H. Switzer,
A. C. Edgar,
Mark Dean,
F. N. Thomson,
H. J. Barron,
W. H. McKiever,
Wiltsie F. Wolfe,
J. J. Blackmore,
Warren Webster,
H. Adams,
L. B. Sherman,
A. S. Hamlin,
John A. Payne,
Thomas Barwick,
Andrew G. Harvey,
John A. Connolly,
Enoch Rutzler,
Richard Hankin,
B. F. Stangland,
Harry Ritter,
John Hopson,
Wm. Kent,
H. A. Smith.
B. H. Carpenter,
F. P. Blodgett,
A. S. Mappett,
A. H. Fowler,
R. C. Carpenter,
J. A. Goodrich,
G. O'Hanlon,
A. A. Carey,
C. F. Hauss,
James Mackay,
A. A. Cryer,
W. A. Russell.
H. L. Anness,

Guests.

Martin L. Kaiser,
John C. F. Trachsel,
C. P. Vanderveer,
B. F. Hurd,
Frank Dobson,
J. George Klemm, Jr.,
Conway Kiewitz,
L. W. Atwater,
C. E. Oldacre,
R. R. M. Carpenter,
A. B. Franklin,
W. W. Macon,
Clarence M. Lyman,
Henry A. Gouge,
L. D. Collins,
J. C. Faulkner,
W. L. Clark,
Charles A. Geoghegan,
J. G. Marsh,
C. S. Mulford,
Elmer Phelps,
L. O. Koven,
G. H. Koven,
John A. Fish,
R. M. Stockwell,
Douglas McCallum,
A. W. Ross,
John M. Bruce,
C. H. Corbett,
Roy Quay,
M. E. Philbrick,
A. Boring.
C. C. Finkler,
T. R. Schenck,
J. Leland Wells,
A. A. Ray,
J. H. Lindsay,
Henry R. Marshall.
W. A. Lawson,
H. W. Jones,
E. R. Burroughs,

The president then made the following address:

President's Address.

It is my privilege as well as my duty to address you to-day upon matters of interest to the society. I do not propose to confine my remarks to those things pertaining to the present condition as to members or money of our society, because of these you will learn from the reports of the secretary and treasurer, and as to what work has been done during the past year by the committees you will learn from the reports of their chairmen. I propose to speak to you to-day of the heating and ventilating engineer and his work.

During the first half of the nineteenth century engineers were classed under two heads—military engineers and civil engineers. The military engineers were those who did work of an engineering character in connection with military operations. They built forts, military roads, bridges and other structures whose primary use was for military operations, for facilitating offensive and defensive movements. Military engineers were, as a rule, soldiers first and engineers second. Under the head of civil engineers were classed all those men who had to do with engineering work which did not pertain to military operations. All engineering work of whatever character which was civil and not military was done by the civil engineers.

Toward the middle of the nineteenth century the civil engineering work became so varied and diversified that engineers other than military engineers were classed under two heads—namely, civil and mechanical engineers. Civil engineers were those who built structures which were at rest, structures such as bridges, buildings, viaducts, sewage systems, water works, &c. Mechanical engineers were those who built machines, objects which were to be for the most part in motion. They built steam engines, machinery for factories, locomotives, steamships, &c. The civil engineer had to do largely with that part of mechanics called statics, while the mechanical engineer had to do largely with that part called dynamics. Later each of these large branches—civil and mechanical engineering—was subdivided into a number of smaller divisions, and the engineer who did work pertaining to one of the smaller divisions was termed an electrical engineer, a sanitary engineer, a steam engineer, a bridge engineer or a structural engineer, depending upon the branch of work in which he was engaged.

Among the latest of the engineers to acquire a distinct title was the heating and ventilating engineer. The heating and ventilating engineer does work which is largely that of the mechanical engineer. It is his duty to supply the occupants of buildings with heat to keep their bodies warm during cold weather and with fresh air for the preservation of their life and health. The heating engineer should be a mechanical engineer. He should know about engines, boilers, steam piping, shafting and other things about which the mechanical engineer must know; and in addition he must have, to a certain degree, that kind of knowledge which a physician has, in order to enable him to determine what are the effects of too high or too low a temperature upon the human body, what are the effects of too great or too small an amount of moisture in the air breathed by human beings, and what are the effects of impure air upon the health and well being of the occupants of rooms. He must know these things not only from the standpoint of the physician, but also from the standpoint of the engineer; from the standpoint of one who, knowing the good or bad effects of certain things, is capable of devising means by which the bad effects may be eliminated and the good effects only preserved. He must know these things in such a way that he can appear before a board, consisting entirely of laymen or of laymen and physicians, and be able to tell them what things are necessary for the proper heating and ventilating of a structure in order that the persons occupying this structure may live in it with comfort and convenience, and without detriment to their health. He must be able to give reasons for this thing and for that thing; he must be able to overcome the ignorance and prejudice of the unlearned, and, further, he must be able to point out how to obtain those things which he says are necessary to the comfort and health of the occupants. When telling what is necessary he must act the part of the physician, and when telling how to obtain these things he must act the part of the engineer. There are to-day many physicians who, either through old fogyism or lack of broad training, do not know what they should, or at least do not advocate what should be advocated for the proper ventilating and heating of schools, hospitals and other buildings in which large numbers of people are to be congregated for a considerable period of time. These physicians the heating and ventilating engineer must be able to meet on the plane of a physician; he must be able to talk intelligently and in such a way that the physician will understand, and he must be able to convince the physician that he knows what he is talking about and is right in what he says; or he must at least be able to convince those who have the deciding voice in the question of how a building shall be heated and ventilated. Having convinced the physician or others as to what shall be done, the heating and ventilating engineer must then become a mechanical engineer, and must be able to discuss with intelligence and force the proper and most economical method of generating heat by the combustion of fuel, of transmitting this heat from the point of generation to the point of use, and the method or means by which this heat is to be made available for the heating of the building; he must be familiar with the operation of engines and electrical machinery in order that he may choose the proper motor for running the fan or other device for supplying air to the building to be ventilated, and he must know the laws which govern the flow of air and steam through pipes and flues.

It may seem that I am requiring in my assertions a large amount of knowledge for the heating and ventilating engineer, an amount of knowledge which few of us can claim to have. While I think that this is true, and while I think that there are a few of us who know as much as, in my opinion, a heating and ventilating engineer ought to know, still I do not think that I am

setting the standard of knowledge at all too high; nor do I think that the standard I am setting is one which, in a few years, will not be reached by all heating and ventilating engineers who will stand in the first rank of their profession.

It must be remembered that the heating and ventilating engineer is a distinct outcome of a long evolution. The first men to study and agitate the question of heating and ventilating were hardly engineers—they were physicians. They knew what ought to be supplied to buildings in the way of warmth and air, but they did not know how to best attain the results which they sought. These men gave to others, to men who were engineers, simply their ideas as to what should be obtained and left to those other men the work of devising means for obtaining it. These physicians, as I have said before, were in no sense engineers, and the engineers who carried out the ideas of these physicians were in no sense physicians. The result was that there were two classes of men working together—the one who knew only what was desirable and what should be striven for in the way of heating and ventilating; the other who knew nothing of heating and ventilating from the physician's standpoint, who knew only of engines, boilers and machinery, and who simply carried out the dictates of the first class. Each of these classes was mutually benefited by its contact with the other. The physician acquired a knowledge of what could be done from the engineer, and the engineer acquired a knowledge of what should be done from the physician. As a result of this intercourse between the two classes there has sprung up the class of men whom we now call heating and ventilating engineers. And to-day we have in this country many men who know what ought to be done, and who also know how to attain the results desired; men who are learned in that they have knowledge, and who are wise in that they have knowledge and know how to use it. These men have studied heating and ventilating from the standpoint of the physician and also from the standpoint of the engineer.

To-day physicians are working upon the problems met with in heating and ventilating and are attempting to solve those which are solely problems of physiology or hygiene, and engineers and physicists are working upon those problems which belong to the domain of engineering and physics. The heating and ventilating engineers are by a process of natural selection and evolution becoming divided into three classes. The first class comprises those men who are working, experimenting and studying the experiments of others, to determine what results should be obtained in a properly heated and ventilated building. They are men who, while engineers, are studying the works of physicians and are studying with physicians to determine the effects of high temperatures upon human beings, the effects of low temperatures, the effects of moisture in air, the degree of impurity which results from the breathing of air by human beings, and other questions, which, while they have been studied for many years, are still unanswered and about which there is yet much to be learned. To this class belong also the physicians, physicists and scientists who are studying heating and ventilating almost as an abstract science. To the men of this class is due the progress of heating and ventilating as a science.

The second class consists of those men who partake in their make up and training more of the engineer than the physician or the physicist, and who consider only the means to be used in carrying out the wishes of the first class, who devise apparatus for heating buildings and apparatus for ventilating buildings; men to whom we must look for those improvements in heating and ventilating devices which will enable us to properly and economically heat and ventilate buildings. To this class belong those who design, construct and erect heating and ventilating plants, and also those men who invent new systems and new apparatus for heating and ventilating. To the men of this class is due the progress of heating and ventilating as an art.

The third class consists of those men who partake of the nature of the men of both the first and second classes; those men who, on account of their training and scientific knowledge, are able to judge of the questions of heating and ventilating largely from the standpoint of the physician and physicist, but who also, on account of their practical engineering knowledge and training, are able to judge of the devices used in the art of heating and ventilating. To this third class belong largely those men who devise the rules, formulas and tables upon which all or nearly all calculations pertaining to heating and ventilating work are based. The men of this class are the connecting link between the men of the first and second classes, and are helpful to both. They collaborate, compare and study the work of the men of the first class, and, having separated the wheat from the chaff, transmit the results of their labors to the men of the second class. Through their work the science is reduced to an art and the art to a science.

In this country there are few men, or, I should say, few heating and ventilating engineers, who are making experiments or working with a view to determine what results should be attained in a well heated and ventilated building. Nearly all of the heating and ventilating engineers of this country are working toward means of attaining those results which physicians or engineers in other countries tell us should be attained in well ventilated buildings. In other words, there are few in this country, few even of the members of the American Society of Heating and Ventilating Engineers, who belong to what I have termed the first class of heating and ventilating engineers. Nearly all of us belong to the second class. That is, nearly all of us are concerned in devising means for carrying out work, for heating and ventilating buildings as others tell us they should be heated and ventilated. There are a few who make experiments, and there are fewer still who use their own experiments or the experiments of others, in order to formulate rules or equations to be used in designing and laying out heating and ventilating plants. In Germany I think it may be said that there are more men who concern themselves with what results should be attained in a well heated and ventilated building than there are men who concern themselves with the devices required to attain these ends. That is, there are more men who are experimenting and working to find out what should be attained than there are men who are working and experimenting in order to determine how to attain these ends. In this country the heating and ventilating engineers are hardly scientific enough. They are scientific only in the adaptation of means to an end. They are not scientific in their search for the end. In this country our engineers are too practical, they lean more toward the devices used to attain the end than toward the end itself. But it has been this tralt in the heating and ventilating engineer of the United States which has enabled us to make such rapid strides in the art and to forge so far ahead of other countries in the attainment of well heated and ventilated buildings. In Germany I think that they are too scientific in their search for the end to be attained and not practical enough in their use of machinery or devices to attain this end; too much time is given to the science and not enough to the art. In England I believe that the engineers are behind the engineers of either this country or Germany. So far as I can gather, they seem to be followers only. They do not seem to be making experiments to determine either what results should be attained in a well heated and ventilated building, or experiments to determine how best to attain those results which should be attained. There are few of their engineers who are prominent in either the science or the art of heating and ventilating.

As this society was the first society of heating and ventilating engineers in the world, and as it has been followed by the formation of societies of heating and ventilating engineers in Germany and England, so I think that the work of the heating and ventilating engineers in this country stands first and ahead of the work of the heating and ventilating engineers of any country. And while we may pride ourselves on this fact—and fact I think it is—we must not forget that in order to hold this powerful position we must work, and work not alone in one line. We must work in the science as well as the art of heating and ventilating. We must experiment and determine what results should be obtained in well heated and ventilated buildings, and then we must continue our work to determine how best to attain those results. We must have engineers or experimenters who will determine the effects of temperatures, the effects of humidity and the effects of impure air upon the human system; we must have engineers who will tell us how to improve the apparatus which we now use, how to attain the best results most economically and satisfactorily; and, further, we must have those men who will devote their time to the study of experiments in all branches of the science and the art, and to the working up of the experiments, in order that they may formulate the results of these experiments and give them to us in the form of rules or equations which can be understood and used by all. Without the science there will be but little progress in the art, and without the art the science is of little value. Each is dependent upon the other, and the more in harmony they are advanced the more rapid will be the progress in heating and ventilating and the greater will be the benefit derived by the human race.

The American Society of Heating and Ventilating Engineers is fortunate in being able to class among its members men who belong to the three classes of heating and ventilating engineers of which I have spoken before. The transactions of this society has been for several years in the past and will continue to be in the fu-

ture a repository of the results and information obtained through the work of its members. And it is to be hoped that the society will grow and coutinue in its place of usefulness, and that it will also broaden its sphere of work by inducing all of the many men who are working in some way or other in connection with the science and art of heating and ventilating in this country to become members of it and to put on record in its transactions the results of their experience and work. No man in this country is too big for the society, and the society is not too big for any reputable man who can aid in the least the advancement of the science and art of heating and veutilating.

New Members.

The secretary auuounced the election of the following uew members during the year:

James Curran,	Harry Lovell Anness,
J. Louis Wentworth,	William G. McPherson,
Polhemus S. Hudson,	Henry Hamelle,
Willlam C. Dean,	Wilhelm Dahlgren,
Henry Krles,	Henry A. Smlth,
Elmer E. Palmer,	William Roswell Stockwell.

The secretary's report showed an increase in membership of 12 during the year, making a total of 143 members on the roll of the association. The proceedings of the society are now regularly sent to 34 colleges aud technical societies by the secretary. The holding of a successful sumuer meeting at Chicago was reported.

The treasurer's report showed that the society had been able to meet its bills by delaying the printing of the proceedings of the last aunual and summer meetings.

The Board of Governors reported that five meetings had been held during the year and that there had been an increase in membership. The report showed that a cousiderable sum was owed by the members for dues and prompt payment of these back dues was urged, as the lack of fuuds caused by the delay in their receipt had made it necessary to hold back the printing of the aunual proceedings. The report recommended that in future the proceedings be printed more promptly; also that the constitutiou and by-laws, with list of members, be printed at the close of the meetiug. The board also reported delay in receiving the papers prepared for the meetiugs, making it impossible to distribute printed copies among the members previous to the meeting, aud urged that papers be presented earlier in future.

The Committee on Compulsory Legislation reported that bills to provide for the ventilation of buildiugs had been before the legislatures of Pennsylvania, Maryland, Michigan, Illinois and New York, and that while the bill before the New York Legislature last year was defeated the measure had beeu preseuted again this year, with a better outlook for its enactment into law.

The Committee on Tests reported offering its services to the District Attorney of the county of New York last spring for investigatiug the conditious in the tunnel of the New York Central Railroad. The Grand Jury was strongly inclined toward the use of electric traction as a solution of the trouble, otherwise the offer would probably have been accepted.

The special Committee on Professional Charges reported that after correspondence with the Institute of Architects in referencc to professional fees, the following clause was incorporated in the schedule of minimum charges by the Institute of Architects:

"Where heatiug, ventilating, mechanical, electrical and sanitary problems in a building are of such a complicated uature as to require the assistance of an engineer, the owuer is to pay for such assistance as the architect may require. Chemical and mechanical tests, when required, are to be paid for by the owuer."

On motion, W. N. McKiever, H. J. Barron and A. E. Kenrick were appointed a committee to consider changes in the membership application blank.

The president appointed S. A. Jellett, H. J. Barron and A. G. Paul as tellers to count the vote for officers. The meeting then adjourned.

TUESDAY EVENING.

The eveniug session was called to order at 8.30 p.m. by President J. H. Kinealy. The report of the tellers showed the electiou of the following officers:

President, A. E. Kenrick, Brookliue, Mass.

First Vice-President, Andrew Harvey, Detroit, Mich.

Second Vice-President, R. C. Clarkson, Philadelphia, Pa.

Secretary, W. M. Mackay, New York.

Treasurer, J. A. Goodrich, New York.

Board of Governors: J. H. Kinealy, R. C. Carpenter, John Gormly, Wm. Kent and C. B. J. Snyder.

A paper eutitled "Hospitals for Coutagious Diseases and Their Ventilation," by Thomas Barwick, presented elsewhere in this issue, was then read and discussed, as follows:

JOHN GORMLY: There should be some kind of check valves to prevent back currents in the ventilatiug flues under some conditions in hospitals where different diseases are being treated. Similar precaution should be taken with the water supply, aud the drainage systems should be subjected to a process of disinfection.

H. J. BARRON: Unfortunately the engineer is seldom consulted either by the doctors or architects in the designing of such buildings. Ideal conditions would be provided iu a system forcing fresh warm air into a hospital building and exhausting the air from the building and driving it into the boiler fire box as far as possible aud the rest of the air out into the atmosphere through an uptake shaft.

S. A. JELLETT: In such buildings the question of cost always must be considered first. The conditions are that a hospital must be of the elastic character to suit the conditions. An epidemic increases and subsides and the heating system must be adapted to these requirements. A blower system of ample capacity with sufficient size in the ducts and blower is best, inasmuch as the fan cau be speeded up as more air is needed and more sectious of the heater can be brought into use. The conditions, however, are that the large hospital with an ample heating and ventilating apparatus is never needed until an epidemic is at its highest, when it is too late to provide it, and the need often passes before it is provided. In all large cities the engineer is confrouted by the same proposition and so far it has not beeu met satisfactorily.

THOMAS BARWICK: In answer to the question of A. E. Kenrick a separate flue from the fan to each room is uot necessary where the fan is kept running. In small buildiugs for a dozen or so patients a gravity system could be nsed with efficiency and the item of cost disposed of more readily.

A. B. FRANKLIN: At the hospital at Rutlaud the State of Massachusetts has a series of one-story buildings where consumptives are cured by the fresh air treatmeut, where temperature is secondary to an abundance of fresh air and sunshine. This is largely outdoor treatmcnt, and the engineer who most nearly provides these conditions in buildings that he is called upon to heat and veutilate most satisfactorily solves the probleu.

Topical discussion occupied the meeting until adjournment.

WEDNESDAY AFTERNOON.

The meeting was called to order at 3 p.m. by the president, and opeued with the reading of the preliminary report of the Committee on Standards on a "Code for Testing Direct Radiation Heating Plants, Together With Discussion on Same at 1901 Meeting," which was then discussed as follows:

JOHN GORMLY: A time limit should be set for a test, and it should be specified that all doors between different rooms be either open or closed. A thermometer should be provided in each room.

J. J. BLACKMORE: The code presented is entirely tentative, aud is for the purpose of being discussed with a view to improvement.

WILTSIE F. WOLFE: The committee has done a commendable work in starting a discussion with a view to finally produciug a code for testing direct radiation heating plants in buildings. I hope that the members will lend their assistance to the perfection of it, and that it will then be widely distributed among the architects and others with whom the heating engineer comes iu contact. At least four thermometers should be used, and should not vary more than 2 degrees when placed not less than 2 feet from the walls in the coruers on the same horizontal line.

C. E. OLDACRE: After a plant has been in use several months a test was made, when it was found that an almost invisible crack permitted a current of air to play on

a thermometer so as to hold the thermometer at 68 degrees, whereas when the same thermometer was hung on a chandelier 5 feet from the floor a temperature of 76 degrees was recorded. More than one thermometer should always be used, as one or more are often affected by air currents. By this means an average temperature will be shown at the guaranteed light.

W. F. Wolfe: When this code is finally accepted it should be indorsed by the society, and then generally distributed as a standard method of conducting such tests.

C. R. Bishop: The society would be benefited by finally adopting a code that could be referred to as standard when it is found necessary to conduct a test. The different requirements should be specifically stated. Such a code might not be applicable in many instances, but could be modified so as to be at least valuable as a guide.

H. J. Barron: This code is not adapted to much of my work, and I doubt if it or any code can be devised that can be of even general value.

A. B. Franklin: Any code, test or contract of a heating engineer or contractor should be prefaced by a statement that the building shall be put in proper condition before the heating apparatus shall be subject to test by any code.

J. H. Kinealy: This code has been presented by the committee so that when any one is called upon to make a test of a heating apparatus this code may be used or some other. It is mandatory on no point, except as to the minimum provisions and the instruments. In all other things, the test made may be as much more extensive as may be desired, where a direct radiation plant is under consideration. This code is submitted for trial by the members to be perfected.

On motion the report was referred to the committee to be revised for further report at the next meeting of the society.

The paper, "The Temporary Warming of the Large Hall of the Royal and Imperial Palace Library, Vienna, Austria, for the Visit of His Imperial Highness, the Crown Prince of Germany, April 14, 1901," presented by Prof. Edward Meter of the Imperial Technical High School of Vienna at the meeting of the German heating and ventilating trades, and translated by Charles F. Hauss, was then considered.

W. Kent: This paper is an excellent one, and a very clear description of a large piece of work done so quickly that it would have been creditable to any American engineer. It is a character of paper that should more frequently appear at our meetings.

H. J. Barron: The paper is valuable in giving an account of actual work that can be studied with confidence and benefit. Similar papers on our own work would be valuable records for the society.

The paper on "Depreciation, Maintenance and Interest Charges," by Reginald Pelham Bolton, presented elsewhere in this issue, was then read.

W. Kent: This paper is a step in the right direction, but does not go far enough. The estimate for interest is correct, but the estimate for maintenance and depreciation is too high, as pumps and boilers will last much longer than the time mentioned as well as pipe and radiators, and a much longer time should be considered.

J. Gormly: I have samples of pipe taken from the heating system in a dwelling, where after seven years there are holes in the pipe that can be looked through. If pipe will only last seven years it would seem that the conclusions of the paper must be modified.

A proposed change in the membership application blank was referred to the Board of Governors. The report of the Committee on Uniform Contract was also referred to the Board.

Topical discussion was then take up.

The meeting adjourned at 6 p.m., to accept the invitation of the New York members to a dinner at the Arena to the visiting members.

THURSDAY MORNING.

The meeting was opened at 11 o'clock by Vice-President A. E. Kenrick.

The paper entitled "An Investigation Into the Difference Between the Coefficients for the Thermal Conductivity of Building Materials Obtained by Piclet and Those Obtained by Later Experimenters," by A. R. Beck, was then read and discussed. On motion R. C. Carpenter and J. H. Kinealy were invited to prepare a written discussion of this paper to be presented in the proceedings of this meeting.

Discussion was taken up on "What is the Advantage (or Disadvantage) of Broad Grates with Shallow Firing Over Deep Fire Boxes and Intense Concentrated Fires on Small Grates in Hot Air Furnace Heating?"

W. Kent: There is an advantage in favor of the broader grate.

M. L. Kaiser: The larger fire surface has the advantage of more efficiency and the deeper fire of requiring less attention.

B. H. Carpenter: A deep fire is conducive to waste.

H. A. Smith: Where the fire chamber is proportioned to the work some economy in labor attends the use of a smaller, deeper fire.

Clarence M. Lyman: A fire of good efficiency can be maintained in fire pots of tapering construction.

W. M. Mackay: My experience has been that a deep fire under slow combustion meets the demands of the user who wants a fire to last a considerable time without attention and yet do good work.

W. F. Wolfe: Fires that are broadest at the grate, under my observation, have advantages.

C. E. Oldacre: Some experiments made with the same upper furnace construction showed that 56 pounds of coal did the required work with a deep fire, while 104 pounds were required with a shallow fire, the other conditions being practically the same. In combination heaters the water heating surface should be placed in contact with the fire in deep fire constructions to get good results, otherwise the water heating power will be very low, except under rapid firing, when a flame plays against the surface suspended above and out of contact with the fire. A record of the temperature of the gases passing from the fire at the chimney varied according to the firing from a maximum of 320 degrees down to less than 100 degrees at times.

W. Kent: I hope furnacemen will some time arrange to test a furnace system so as to establish some scientific data on this branch of heating.

In discussing the topic, "The Tudor System of Steam Heating as Compared with the French System," as presented by M. Debesson in a paper read at the last annual meeting, the opinion was freely expressed that the various vapor systems of heating had followed the introduction of the Tudor system of heating. Discussion of the various vapor systems of heating occupied the morning session until adjournment.

THURSDAY AFTERNOON.

The meeting was called to order at 3 o'clock by the vice-president, and discussion was opened on the topic, "What is the Advantage of Flame Heat from Active Firing of Small Quantities of Coal Over Heat Radiated from Heavy Intense Fires?"

A. A. Carey: Aside from the fact that the flame often reaches points not subjected to the radiant heat of the fire, flame heat is less powerful.

W. F. Wolfe: Visible flame is generally due to imperfect combustion, and is not as strong in its heating effect as a radiant fire.

On motion, the holding of a midsummer meeting was left to the discretion of the Board of Governors.

On motion, the preparation of a base schedule for professional charges was referred to the Special Committee on Professional Charges.

A paper on "The Performance of Centrifugal Fans Under Actual Working Conditions," by H. Eisert, was then take up, but owing to the lack of time, discussion was deferred.

The new officers were installed, each being introduced to the society and accepting the duties with appropriate remarks.

Andrew Harvey spoke of the benefit to be derived from making the tenth anniversary of the society, two years hence, an occasion for a special celebration. On motion, a special committee of ten members, to be appointed by the president, was provided to devise some plan for making the tenth anniversary meeting of the society one of special interest. The president then announced the appointment of the following:

Committees for 1902-3.

COMPULSORY LEGISLATION.

W. M. Mackay, Chairman.
Henry Adams.
Andrew Harvey.
T. J. Waters.
B. H. Carpenter.

UNIFORM CONTRACT AND SPECIFICATIONS.

S. A. Jellett, Chairman.
Wm. H. McKiever.
H. J. Barron.
R. P. Bolton.
F. A. Williams.

STANDARDS.

J. H. Kinealy, Chairman.
Herman Eisert.
H. A. Joslin.
J. J. Blackmore.
Charles G. Folsom.

TESTS.

Albert A. Carey, Chairman.
Wm. Kent.
C. M. Wilkes.
James Mackay.
B. F. Stangland.

Discussion was then taken up on the topic, "What Can We Do to Impress Upon the Owners of Buildings and Architects the Necessity of Adequate Smoke Flues for Heating Apparatus?" On motion, this was referred to the Committee on Standards, with instruction to prepare a table of chimney sizes based on the requirements of water tube boilers.

On motion, the topic, "What is the Proper Proportion of Grate Surface in a Boiler to the Radiating Surface in a Building in Low Pressude Steam and Hot Water Heating," was referred to a special committee to be appointed by the president.

After the usual complimentary motions a motion for the final adjournment of the meeting was carried.

ENGINEERS' DINNER.

The New York City members of the American Society of Heating and Ventilating Engineers never dispensed a more generous hospitality than in the annual dinner to the visiting members at the Arena on Wednesday evening. This annual dinner affords an excellent opportunity for new acquaintances to be made and friendships to be established among the members, that result in an increasing strength to the society. It is by no means the least important feature of the annual meeting.

After disposing of a well selected *menu*, the members and guests enjoyed the introduction of the speakers to the various toasts, made in a most happy manner by Past President R. C. Carpenter, who acted in the capacity of toastmaster. The first speaker was A. E. Kenrick, who spoke on "The Progress of the Art in the East." Mr. Kenrick made the point that Massachusetts was the pioneer State on compulsory ventilation. W. F. Wolfe spoke on "The Extreme East; or, European Practice," applause followed the claim that American practice was in the lead. In a speech on "Heating and Ventilating Schools," by C. B. J. Snyder, the diners rose to the statement that "Our society has greatly aided improvement in this field in New York City."

S. A. Jellett, speaking on "Steam Fitters," said that "they fill the gap between the engineer and owner." W. Kent spoke on "What We Are." Applause attended the definition given: "We are the leaders of the world in this branch of industry." Andrew Harvey, in treating "Improvement in the West," made the statement, "Too busy working in the West to do any better than the best we know," which brought down the house.

H. R. Marshall's toast was "The Relation of the Architect to the Engineer." Laughter was called forth by the representation that the early Greek and French architects had a rather easy time of it in not having to contend with the heating and ventilating engineer and the other myriad complications of modern buildings. The next speaker was A. A. Carey, on "The Mechanical Engineer." After pointing out how the two branches of engineering are in constant touch, he gave an interesting account of the investigation of the condition of the New York Central tunnel, and attributed the recent disaster entirely to the lack of ventilation. H. J. Barron followed on "The Past and Present of the Society." The society's one aim, he said, was the desire to represent all branches of work, and to be open to all engaged in it in whatever capacity.

Ex-Senator Albert A. Ray spoke on "Legislation for Ventilation." Applause marked the expression of his opinion that the society was more closely engaged in work that most nearly touched the vital interests of the whole people than any other body, in its efforts to provide laws that would insure their greater health and comfort through compelling buildings to be erected so that they would be filled with fresh, pure air.

Frank K. Chew spoke of "The Press" as the invaluable and indispensable aid to all progressive steps in heating and ventilation, and all other lines in preparing the public to understand, accept and assist in the advancement of all public interests.

New York City Notes.

The assembled guests at the reception of Brooklyn Branch last Tuesday evening had their attention called to an apparently motley crowd who arrived late, each one of whom had his collar turned up and hat pulled down and with a clay pipe in his mouth, and who said they had come to give an "honest" smoke test. After being admitted they proved to be a delegation from Manhattan, headed by President I. J. Brown, and composed of Messrs Donohoe, Kirchhof, Philip Brady, T. S. Cochrane, Jr., Corkery, Renehan, Schiffer, Hill, Loeble and Clerk Lockwood. They found President A. H. Brown, ex-President Malcolm and E. J. Brady waiting for them there, and were royally entertained by the Brooklynites.

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Although it was an inclement night and the two branches were holding the regular meetings, Manhattan sent its delegation as above and Queens was represented by John Anderson of Flushing, F. X. Meier of Richmond Hill and G. W. Perry of Jamaica.

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Paul S. Bolger, in addition to his Mount Sinai Hospital and other work, is plumbing the new building of the New York *Press* at 11 to 15 Spruce street.

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E. J. McCabe & Co. are overhauling the old McCreery Building, at Broadway and Eleventh street, which is being altered into a loft building.

* * *

The many friends of Jesse L. De Graw will be pleased to learn that he is recovering from the shock of paralysis he sustained two weeks ago.

* * *

Retrenchment in some of the city departments makes them want to do their own plumbing work. The latest to suggest such a thing is the Board of Education. The Dock, Police and Bridge departments already do some work, and unless the matter is brought to an issue there will be very little repair work for plumbers in the city departments.

* * *

The plumbers and supply men should unite in defeating the bill introduced by Assemblyman Wilds to do away with the conditional bill of sale on plumbing fixtures.

The P. and S. S. League.

On Monday night the bowlers in the Plumbing and Steam Supply League again met, and the team of the John Simmons Company retained their lead by winning both of their games, while the Ronalds & Johnson Company New York team lost two games, the F. N. Du Bois & Co. team breaking even. On Thursday night the Thomas G. Knight team lost both their games, and the Dimock & Fink Company team won two games, the Salesmen team losing one game. Both the Knight and Salesmen teams were short one man, yet the Salesmen team scored 700 in one game, to which W. Emery contributed 202 and Henry Stein 230, surpassing his former high score of 222.

DEPRECIATION, MAINTENANCE AND INTEREST CHARGES.*

BY REGINALD PELHAM BOLTON.

The comparison of certain different apparatus, the relative economy of competing devices and the value of improvements, are affected directly by the empirical amounts chargeable against them as interest, maintenance and depreciation.

A common and very crude method appears to be to fix each item in such computations at a rate of 5 per cent. In the course of discussions with representatives of power and heat supply companies desirous of applying their systems to certain buildings, I have been confronted with an assertion that depreciation alone should be charged on independent power and heating plants at the rate of 8 per cent., and that interest should be charged upon the whole cost of the installation at the rate of 5 per cent., additional to maintenance at 5 per cent. I have as a result of these varying and apparently haphazard figures been led to make some inquiry into this question, and venture to think some conclusions gained from New York circumstances will be of interest to members of a society especially connected with the design and installation of operating machinery and appliances necessary to life and comfort.

INTEREST.

In the city of New York the rates of interest on borrowed money vary, of course, with the nature of the security. In the case of buildings and factories the form of security is commonly a mortgage. First mortgages are usually obtainable up to 60 per cent. of the value of the property, and in Manhattan Island at present a rate of interest of 4 per cent. can be obtained, or in certain centrally situated properties one-half of 1 per cent. lower.

The value of some land is so great that a 60 per cent. mortgage upon its value will suffice to erect and equip a very considerable building upon it, but where this is not the case, an owner borrowing six-tenths of the cost of his building on first mortgage may borrow the balance, if he be in good credit, at as low as 5 per cent., of banks, on note, bond or second mortgage.

In a close computation, therefore, it should be ascertained what rate of interest the money represented by a plant involves, but where the information is not obtainable it may be assumed that the rate of interest does not exceed 4 per cent. on six-tenths and 5 per cent. on four-tenths, or a mean of 4 4-10 per cent.

MAINTENANCE.

This is compounded of several elements. Cost of upkeep, replacement and precautionary measures. A reasonable amount of care must be assumed in keeping the apparatus in operating condition. Replacement provides for renewal of working parts, and painting of perishable or exposed material. Renewal of inherently renewable materials, such as packing, comes under this heading. By precautionary measures I understand all such steps as require to be taken in good time to obviate in advance the effects of age or decay.

Naturally such items vary very considerably with all kinds of apparatus, and must be taken into separate consideration.

The cost of maintenance, therefore, varies too widely to be stated as a fixed element, but must be estimated for different apparatus by the results of experience and careful foresight. In a very general way 1½ per cent. on the prime cost of a heating and ventilating plant should suffice to cover the above items and on operating machinery 2 to 4 per cent., according to conditions.

Repairs, assuming the term to deal only with accidental damage or breakage or discovery of defects, can be properly covered by insurance or by civil suit, and, if not, are to be assumed as an unknown risk. They are not a part of maintenance.

DEPRECIATION.

This is a charge which is calculated to represent the gradual deterioration of a plant, resulting in its eventual wearing out. In certain cases it has been assumed also to represent the superannuation of a plant, or, in other words, its loss of competitive power by reason of the advent of improved appliances.

In a general way I consider both these elements are overestimated. It is common to have a sweeping limit of 10 or 15 years assigned as the life of a plant, on one or other of the above grounds. While the policy of clinging to antiquated and unproductive machinery is not in consonance with modern ideas of profitable operation and is not here recommended, it must be pointed out that it is not an argument against assigning a reasonably long life to any apparatus, that its use may be found sooner or later to be less economical than improved apparatus. Such improved appliances will, if sufficiently economical, justify in their results the entire renewal of the existing plant at an earlier date than assigned to it, and the cost of such extinguishment or partial discontinuance is to be borne by or to become chargeable against the results attainable with the improved plant.

New methods may come into existence at any time and cannot be reckoned with as a fixed element in computing the useful life of any apparatus.

Again, the possibilities of remodeling are, in the case of such apparatus as the members of this society are concerned in, very often capable of renewing the life of the perishable portions of installations.

Experience in the remodeling of old plants goes to show that even in such machinery as was built a quarter of a century ago the life of rotating machinery is greater than 20 years, while in boilers of the water tube type, piping chimneys and much of similar apparatus it may be taken at 25 years. Pumping and hoisting machinery of similar age is quite common, in all cases assuming reasonable care and reasonable renewals, for which, as before asserted, separate charges are, of course, to be made.

From the above considerations it may be gathered that in the case of a modern private commercial power or heating plant an assumed life of from 15 to 25 years, varying with the nature of the appliances, is proper, and for the purpose of ready calculation a mean of 21 years can safely be taken.

It is not to be supposed that an owner will regularly lay by annually a sum equal to the amount charged as depreciation, or take the trouble to arrange for its investment and the investment of its interest. It would not, in fact, pay him to do so, because the money is worth more to him in his own business than he could obtain at current rates in the market or savings banks. In practice it is therefore retained in his business or investments, and is earning the rate of interest obtainable therein. In a majority of instances where the business in which the machinery is employed is an actively constructive or manufacturing one, the assumed amount of depreciation is really earning very high rates of interest, often more than 25 per cent. per annum. Under not uncommon commercial circumstances, therefore, the assumed depreciation fund may very moderately be credited with an earning capacity of 10 per cent. compound intrest. With a life of 21 years and a rate of compound interest of 10 per cent. the charge of depreciation becomes only 1½ per cent. upon the capital outlay.

It will be evident how important is the consideration of these standing charges in deciding the relative economy of machinery, but it is seldom that they are properly applied. We often learn of the adoption of apparatus designed to effect a certain economy, the cost of which, if debited with its proper charges, would outweigh the ascertained economy, and which is therefore being operated at a loss. This is particularly the case in the numerous devices for coal saving in boilers, and guarantees of a certain result are apt to be considerably counterbalanced if the proper charges are applied.

An illustration may be taken from a case recently considered in detail:

A high duty pumping plant was offered for a large elevator service with a guaranteed saving of 15 pounds of steam per horse-power of water pumped per hour. Careful estimates showed a probable saving in fuel of $1500 per annum by this apparatus, the additional cost of which amounted, however, to $19,000.

In case the life of the two pumps involved is taken at 20 years, and the rates of interest are as herein stated, the extra capital outlay is to be charged with

Interest, 4 4-10 per cent.	$836
Depreciation, 1½ per cent.	285
Maintenance, 3 per cent.	570
Additional oil.	70
Total	$1,761

showing that the pumps will be run at a loss of $261 per annum, which capitalized at 4 4-10 per cent. represents a sum of nearly $6000. By applying the charges to the saving guaranteed it will be seen that the saving justifies only a capital outlay of $16,780. Therefore to show any gain the cost of the improvement must be less than that figure.

* Paper read at the eighth annual meeting of the American Society of Heating and Ventilating Engineers, New York City, January 21-23, 1902.

FRED. FOX, JR., president of the Tennessee State Association of master plumbers, has been visiting the cities of Memphis, Nashville, Clarksville and Murfreesboro, for the purpose of organizing associations of master plumbers in those cities. He was accompanied by some of the members of the Chattanooga and Knoxville associations, to aid him in the work.

HOSPITALS FOR CONTAGIOUS DISEASES AND THEIR VENTILATION.*

BY THOMAS BARWICK.

Hospitals for contagious diseases should be built of fire proof materials. The cruciform plan should be considered as the best for such a building, or they should be built with provision for the administrative portion at the center and radiating wings for the wards and sick rooms.

The building should be arranged so that at one point, either front or rear (preferably the rear), the reception of the patient may be provided for without being brought in contact with the administration offices of the building. Arrangement should also be made so that the patient may be quickly transported to the various wards or confining rooms, either by means of an elevator or graduated stairway, without passing through any of the administration portion.

The design for such a building would be two stories in hight, the sick wards being placed on the upper story and the convalescing wards or rooms on the first story. The basement portion of the administration part of the building should be arranged to receive the mechanical plant for the heating and ventilating and other requirements, the wings being left for the heating and ventilating ducts, &c.

The first story of the administration portion should be arranged for the administration uses only, the second story for operating rooms, &c., in connection with the wards. The floors throughout the building should be of granolithic; the walls on the inside should be of glazed brick, terra cotta, or tile, so that they may be washed down at any time. Partitions should be constructed in a similar manner, and the doors and window sash should be made of iron, or covered with metal, and as little paint as possible should be used in the building.

The first floor should be arranged with individual rooms or double occupant wards. In no case should the wings extend beyond six beds in depth, allowing for 12 occupants in the ward, with a preference for smaller wards than the above, so as to isolate the different diseases as far as possible. There should also be a preference for wards on the second story with ante-rooms, baths, toilets, &c., arranged adjoining the administration portion, and separated by proper closed vestibules. The building should also be provided with its own domestic machinery, such as cooking, laundry appliances, &c.

Such a building should be built with proper elevation above the surrounding country to give it a free and clear drainage from any surface water that may interfere with its foundations or percolate through the floor of the basement.

The heating and ventilating apparatus should be confined to the basement portion in the wings. The building should be arranged to be warmed by a system of heating stacks placed on standards and inclosed in galvanized iron at the foot of the vertical flues in the basement, and arranged with double dampers, so that at any time if a higher temperature is required in one room or ward, the same can be secured through the medium of warm air, the air passing into the various rooms through large plain fretwork grills. Each room should have a thermostat with a wide range, so that the temperature may be maintained to suit the conditions.

The air supply should be brought from a point as far from the general building as possible, so as to provide for uncontaminated air, and should be forced through the rooms by means of a blower driven by any motive power that may be adapted to the work.

The air supply for such a building should be carried up in the walls through terra cotta flues enameled or glazed on the inside so as to be germ proof as far as possible, terminating in the rooms at a point, say, 8 feet above the floor line, so as to provide for the distribution of air through the rooms without drafts upon the patients, and in the wards the inlets should be as near as possible between the beds.

The velocity of air entering into the rooms should be extremely low, if possible not over 250 feet per minute for any current of air entering the room, and should be tempered at the inlet of the fan by means of a tempering coil controlled by thermostats to a temperature of 65 degrees maintained by thermostatic regulation, and the additional heat supplied by the stacks at the foot of the flues.

The fan for doing this work should be constructed so that there will be no noise, and should be of large size so as to run at a low velocity. The arrangement of the heating apparatus, including the piping, radiators, tempering coils and the boiler, should be of ample size to maintain the building at 70 to 75 degrees under all conditions of weather, with sufficient reserve in all of the indirect stacks used as reheaters to increase the temperature in any room from 80 to 85 degrees. The boiler capacity for domestic use should be provided as well as for the heating. This could be accomplished by means of two boilers, and as far as possible there should be a duplication of parts of the system, so that should any portion of the apparatus become out of order it would not necessitate the closing down of the building.

In supplying air to such a building it is necessary to have a very large volume, so that the percentage of vitiated air will be kept to a very low degree. For buildings of this class I should recommend not less than 5000 to 6000 cubic feet of air per hour for each occupant—that is, to each individual in a room. The administration portion of the building could have slightly less than this amount, but my preference would be for the full volume throughout all portions of the building.

The vitiated air from the various rooms should be collected through vertical flues carried down to the basement, connecting into sealed ducts formed of brick or terra cotta, and the inside of each flue should be enameled or finished in similar manner to the heat flues. Each wing should be entirely independent of the other, and the vitiated air ducts connected into vertical uptake shafts (or they may be carried down to one central point to a vertical shaft), carried far enough above the top of the building, so that the discharge from the shaft will not contaminate the air in the neighborhood.

The vitiated air should be collected into a receiving chamber at the foot of the vertical uptake shafts or shaft and passed through a disinfector, in which the air should be burned, either by means of a coke fire or a furnace especially designed or by highly heated steam coils, a jet or spray of steam being introduced into the chamber so as to destroy the disease germs as far as practicable, in the same manner as clothing is disinfected by means of steam disinfecting chambers, or the air could be passed through one of the well-known disinfecting tanks that are at present in use in various parts of the country. By these means we may be able to destroy the live germs passing through the air.

Sweepings and dust from these rooms should also be conveyed to this vertical uptake shaft, either by means of a blower or by an induced draft in the vertical shaft. Perforated steam pipes could be introduced in the main air supply ducts and in the vent ducts and vertical flues where possible, so that the entire space may be flooded with steam. Humidifiers should be placed in each room and automatically regulated. The windows in such a building should be sealed in such a manner that they cannot be opened to the outside air, dependence being placed upon the heating and ventilating apparatus.

Provision should also be made for the fumigation of the rooms by such means of fumigation; by Formaline or other disinfectors as are at present in use and found adaptable. Each room could be separately treated through the supply and vent flues by using proper dampers.

Water should be introduced (both hot and cold) into each of the wards and rooms, so that the walls, ceilings and floors may be thoroughly washed down. As far as possible, the ventilation from the rooms would be best if taken near the floor, as the tendency for the heavier bodies and small particles of clothing, &c., is to settle at the floor line; therefore, they will be conveyed by the air current to the various outlets and thence to the disinfecting chambers. Clothing should be thoroughly disinfected in disinfecting chambers placed in each of the wards or wings before being taken to the laundry, these chambers being located at some point accessible to each ward independent of the administration portion of the building.

Such buildings can be built in cities where the population is crowded, or situations that are of limited area in their districts, without fear of contagion to any portion of the surrounding country.

Some of the buildings that I have investigated have been frame structures, many of them being supplied with simple direct heating apparatus, the radiators being placed in the rooms, and no proper provision being made for the supply of fresh air or ventilation. The studding of the building was constructed of wood and plastered, with the idea that the occupancy of the building would be temporary, and so that at any time the building may be burned or destroyed; but the general run of these buildings have been in use from 12 to 13 years. Through improper care and lack of funds the buildings have become permeated with vermin and bacteria, and as the buildings are constructed with no proper provision for ventilation or supply of fresh air, they are entirely unfit for the purpose designed. Some of these buildings have small ventilators placed in the ceilings, connected with cowls on the roofs, emptying into the surrounding air without any provision to destroy the germs in the vitiated air, and allowing the same to escape to the surrounding atmosphere, thus creating an actual nuisance.

In buildings for this use it should not be considered

* Paper read at the eighth annual meeting of the American Society of Heating and Ventilating Engineers, New York City, January 21-23, 1902.

that the cost of construction or cost of operation is the first requisite for such a building. The general health of the public should be considered first, and above all other circumstances. The cost of maintenance of such buildings as before described will be considerably beyond the cost of those that are now constructed in some parts of the country, but the menace to the public health where the cheaply constructed buildings are used is a constant dread at all times; therefore, I should recommend that for contagious diseases buildings should be constructed with proper ventilating requirements, and so that they may be entirely fumigated and cleaned without any possibility of contamination.

ASSOCIATION NEWS.

Wisconsin State Master Plumbers.

The eighth annual convention of the Wisconsin State Association of Master Plumbers was held in Milwaukee on January 14 and 15. The meeting was called to order by President Dengel, with a large attendance from all parts of the State. The time of the convention was devoted to the development of plans for trade protection along the lines of the Cleveland Resolutions. The association has concluded a local agreement between the manufacturers and jobbers, for the purpose of securing protection against the "skin" plumber and the "jerry" builder. The advisability of a State organizing officer was also discussed. On taking up the election of officers the following were elected for the ensuing year:

President, Frank R. Dengel, Milwaukee.

Vice-President, C. W. Nelson, Neenah.

Treasurer, George Kraft, Madison.

Secretary, Hugo Lippert, Milwaukee.

Delegate to Interstate League, L. R. Stollberg, Milwaukee.

Delegates to National Convention, H. Raymond, Racine; W. H. Halsey, Milwaukee.

Alternates, W. P. Wray, Green Bay, and C. W. Nelson, Neenah.

The invitation to hold the next convention at Milwaukee was accepted. The delegates were entertained at a theater party and a banquet, at which National Vice-President Charles Polacheck acted in a most happy manner as toastmaster. His remarks included an eloquent tribute to the National Association.

Illinois Master Plumbers.

The tenth annual convention of the Master Plumbers' Association of Illinois was called to order in the auditorium of the City Hall, East St. Louis, on January 20 by President J. M. Dougherty of Ottawa, Ill. The session lasted two days, closing on January 22 with a banquet and election of officers. The following were elected to serve for the ensuing year:

President, J. Boyd of Chicago.

First Vice-President, E. B. Hazen of Peoria.

Second Vice-President, J. D. Blake of Aurora.

Secretary, William Redieske of Chicago.

Treasurer, John C. English of East St. Louis.

Delegates to the annual convention at Atlantic City, N. J., were also elected. The next annual convention of the Illinois Association will be held in January, 1903, at Rock Island.

Where Is Walter F. Bolger?

At the request of Paul S. Bolger, a plumber, 378 Park avenue, New York, we present the following notice of the New York City Police Department, hoping that any one who can assist the father and mother in finding their son will lend their aid. Mr. Bolger offers a reward of $500 for information that will lead to the return of the boy to his home:

Walter F. Bolger disappeared from his home, Yonkers, N. Y., on Thursday, November 19, 1901, taking the 11.30 train to New York City, and has not since been seen or heard from.

He is 18 years old, but may be taken for older. Hight about 5 feet 11 inches, medium built, broad shoulders, stands erect. Weight about 178 pounds. Wears No. 8 shoes. Blue eyes, heavy light brown hair, parted near center; fair, clear complexion, of a retiring disposition, is very intelligent and quite fond of reading, particularly magazines. In conversation would be likely to discuss matters not usually interesting to boys. Does not smoke or drink. Might frequent theaters.

When he left here he wore the following garments: Light soft hat, light band; Oxford gray overcoat (coming to the knees); dark mixed gray suit, pants, vest and sack coat (of herring bone stitch pattern); black lace shoes, gray stockings, high turned down collar, necktie (usually a rather small knot); overcoat rarely buttoned.

Please detain and all expenses will be refunded.

Address all information,

COL. J. N. PARTRIDGE,
Commissioner and Chief of Police, New York.

ENTERTAINMENT AND RECEPTION OF BROOKLYN BRANCH.

The master plumbers of Brooklyn are to be congratulated on the very successful entertainment and reception given by them last Tuesday evening. Although the elements were against the success of the affair, Schwaben Hall, at Knickerbocker and Myrtle avenues, Brooklyn, was crowded with the members, their families and friends. The entertainment, which consisted of ten numbers, was enthusiastically applauded. At the close of the performance Edward Macdonald, on behalf of the association, presented the retiring president, George W. Smyth, with a very handsome watch chain, together with a jeweled charm suitably engraved, and in a few well chosen words told him how the organization appreciated his untiring efforts for its good in the various offices which he has held. After the grand march dancing followed, and at a late hour the festivities were still going on.

The supply trade of Brooklyn was well represented by principals and salesmen, and many of the Manhattan houses also had representatives at the affair. Delegations were present from the Manhattan, Queens, Richmond and Bronx associations. The guests were well provided for by a very efficient Reception Committee headed by Harry Noble.

Treasurer A. H. Brown and Executive Committeeman B. F. Donohoe represented the State Association; President I. J. Brown and Secretary T. A. Hill represented the Greater New York Association, and John Anderson of Flushing, treasurer of Queens Branch; Fred. Rauscher of Port Richmond, S. I., and Jos. Corkery represented the Queens, Richmond and Bronx branches, respectively. Manhattan was well represented by a dozen or more of the "old guard," headed by ex-National President S. L. Malcolm.

Heating and Plumbing Notes.

B. D. HAMMELBAUGH, secretary of the Board of Control of the school district of Harrisburg, Pa., will receive bids until January 30 for heating and ventilating a 24-room school building, to be erected at Sixth and Woodbine streets, Harrisburg, Pa.

LEWIS BATES has taken a store on Washington street, Weymouth, Mass., where he will conduct a plumbing and steam heating business.

THE striking plumbers of Wichita, Kan., have agreed to go to work at the old rate of wages for 60 days, after which they demand $3.50 a day for senior plumbers and $2.50 for junior plumbers, eight hours to constitute a day's work.

THE NASON MFG. COMPANY, 71 Beekman street, New York, announce that on January 1 they ceased to do any construction work, and in future will devote their entire attention to pushing their extensive line of Steam Fitters' and Plumbers' Supplies. They also have in their Equator and Gulf Stream a well-known line of Steam and Hot Water Heaters. C. P. Vanderveer will visit the trade in the vicinity of New York in the interests of the house.

L. F. GRADY, New Haven, Conn., has the contract for plumbing and hot air heating in two houses that are being built in that city for Thomas Brennan.

THE plumbing of the club house of the Country Club

in Farmingtou, Conn., has just been fiuished by Thomas Oakes & Son of Hartford. The firm also have the contract for the plumbing and wiring of a house for A. D. Pierce, and will furnish gas fixtures for a house which J. E. Mooney is building in Windsor Locks.

The Sanitary Specialty Mfg. Company, 55 and 57 North Clinton street and 24 to 30 Milwaukee avenue, Chicago, have just issued two very neat catalogues. One of these catalogues is devoted to Bathtubs and the other to Plumbers' aud Steam Fitters' Tools. The Bathtub catalogue presents a large number of illustratious of Enameled Iron Tubs of all the desirable styles, including Seat and Foot Baths. The contents further treat of Tubs made wholly of Steel, Steel Shell, Copper Lined Tubs and Copper Tubs to be iuclosed in wood. In addition, a large line of Bathtub Fixtures is shown, as well as Bathtub aud Lavatory Trimmings and Supplies. The Tool catalogue presents a very great assortment of Tools required by plumbers and steam fitters, all the Tools being illustrated and full price-lists being printed in connection with each. These catalogues are each 48 pages in size, and are thus small and convenient for ready reference. They present a much greater variety of contents than would ordinarily be found in catalogues of this size.

E. G. Bates, Springfield, Mass., has the contract for plumbing the new factory which is being erected at the corner of Wilbraham avenue and King street, iu that city, for A. O. Kittredge.

H. T. Gates, formerly of the firm of James & Gates, a wholesale boiler house in New York City, has engaged with the Prizer-Paiuter Stove & Heater Company to look after the interests of the Henderson Thermo line of Steam aud Hot Water Heaters in New York City and vicinity. Mr. Gates has opened an office iu the Mohawk Building, Twenty-first street and Fifth avenue.

G. W. Minor of Waterbury, Conn., has just finished a job of plumbing and heating in M. W. Deuny's house, at Waterville. Mr. Minor is now located in his new quarters in the Pritchard Block, Waterbury.

Daniel Thurber is visiting the heating trade in the vicinity of New York City in the interest of the New York Central Iron Works and the Denning Steam and Hot Water Boilers.

J. J. Ryan & Co., brass founders and finishers, 68-74 West Monroe street, Chicago, report receiving contracts for the Brass Nickel Plate Trimmings for the marble closet and urinal stalls and lavatories for the following buildings: Pasavant Hospital, Mercy Hospital, Wesley Hospital, Rush Medical College, Manufacturers' Building, National Life Building, Chicago Commons, Chicago; Grand Opera House, Cincinnati; McLean County Court House, Bloomington, Ill.; Montana State Capitol, Helena, Mont.; U. S. Post Office, Streator, Ill.; U. S. Post Office, Monmouth, Ill.; U. S. Post Office, Elgin, Ill.; Draper Buildiug, Honolulu, H. I.

A fire visited the plumbing shop of Collins & Spencer, at Saratoga Springs, N. Y., last week, doing a slight damage, which was covered by insurance.

N. J. Lennertz and James C. Smith have been appointed members of the Examining and Supervising Board of Plumbers and Plumbing of Dunkirk, N. Y.

The Munro Plumbing Company of Whittendon, Mass., have moved into their new store at the corner of Bay and East Britannia streets.

Thomas E. Dunn has received from the Board of Plumbing Examiuers a certificate of competency to conduct a plumbing business at Cohoes, N. Y.

The Master Plumbers' Association of San Fraucisco, Cal., have moved their headquarters from the Alcazar Building, to Room No. 90 of the Donohoe Building, 1170 Market street, San Fransico.

Charles Morgan, formerly of Morgan & Ball, will have charge of the new supply department opened by the Stanley Company, at Pittsfield, Mass. This department is for the purpose of reaching small dealers in Arc Light Fixtures, Electric Fans, &c.

In order that his customers may thoroughly understand the operation of his patent Plumbers' Force Pump, John H. Lawless, 184-186 Third street, Jersey City, N. J., is distributing, in addition to an eight-page folder describing the Pump, a picture of the Pump 15 inches high, in the form of a broken and sectional view, so that the working parts can be readily seen. By means of this Pump a high pressure can be developed for opening a stoppage in service and waste pipes.

An open war is being waged at Spokane, Wash., between members of the Master Plumbers' Association and the plumbers who are not members. The local supply houses are refusing to furnish plumbing goods to the outside plumbers, who are arranging to secure their supplies from other cities.

The plumbing inspector of Holyoke, Mass., has refused to approve of the plumbing of the water closets in the new City Library Building, owing to the failure to equip them with local vents as required by law. As a result the Board of Health will not allow the building to be opened for use.

The Board of Education of Grand Rapids, Mich., have awarded to Weatherly & Pulte the contract for heating the Alexander Avenue School, in that city, at their bid of $1760.

At the annual meeting of the stockholders of the Stradling Plumbing & Heating Company, Utica, N. Y., the following were elected directors: E. W. Stradling, E. H. Bice, A. H. Dobsou, John J. Droz and E. J. Stradling. A. H. Dobson and John J. Droz were chosen inspectors of election. At the meeting of the directors officers were elected as follows: President, E. W. Stradling; vice-president, E. H. Bice; secretary, E. J. Stradling; treasurer, A. H. Dobson.

A plumber's furnace, getting too close to the wood work, caused a $400 fire in the plumbing shop of Luther R. Gilson, 115 Washingtou street Boston, Mass., last week.

A meeting of the dealers in plumbers' and manufacturers' supplies was held on January 16, at The Boody, Toledo, Ohio, when trade matters were discussed. Representatives of Detroit, Toledo aud Cleveland concerns were present.

J. F. Kidder of Winooski, Vt., has removed his plumbing establishment to Burliugton, Vt., and will occupy the shop formerly used by Z. T. Austin on Main street.

New Firms and Changes.

L. H. Snyder & Co. are a new firm at Bristol, Conn., who will manufacture Floor aud Ceiling Plates for steam pipes, Plumbers' Supplies and small novelties. Mr. Snyder was formerly superinteudent for the Coddling Mfg. Company.

Howard Gould will opeu a plumbing shop iu Highland, Mass., about February 1.

Joseph McCreery succeeds the heatiug and veutilating firm of Joseph McCreery & Son, at 647 Iufirmary Road, Toledo, Ohio.

The firm of H. Sandmeyer & Co. and the Peoria Heating Compauy of Peoria, Ill., have been cousolidated iu a new incorporated company having a capital stock of $100,000. Among those interested in the new company are: H. Sandmeyer, Sr.; H. Sandmeyer, Jr.; W. D. Dickson and W. D. Shafer. The new company will reward H. W. Kroos, one of their employees, who has been with them for 25 years, by taking him into the firm.

Freeman Thomas, Troy, N. Y., has bought the general plumbing business conducted for years by his father, John L. Thomas.

The American Warming & Ventilating Company of Elmira, N. Y., have been incorporated with a capital stock of $10,000 by L. B. Shoemaker, R. M. Geddes and George McCann.

John Reilly, formerly with Hurley & Reilly, has opened a plumbiug shop at 244 Crescent avenue, Bridgeport, Coun.

The Warnock Mfg. Company of Portland, Maine, have been incorporated under New Jersey laws with an authorized capital of $25,000 to manufacture Plumbing and Hardware Supplies. The president of the concern

is Llewellyn Carlton of Portland and the treasurer Ernest O. Hiler of Boston, Mass.

Pontier & Roosma, plumbers, of Passaic, N. J., have dissolved partnership. The business will be continued by Jacob Pontier, Mr. Roosma having retired.

Application has been made for a charter for the Reading Gas & Electric Fixture Company of Reading, Pa., to be capitalized with $25,000. Herman Schussler of Bridgeton, N. J., who is the head of the new company, is the owner of patents on a number of improvements in Gas and Electric Fixtures, &c., which the firm will make a specialty of manufacturing. A large plant is being fitted up in Reading, and the company already have a number of good orders on their books.

Hardware Organizations.

Missouri Retail Stove and Hardware Dealers' Association.

The annual meeting of the Missouri Retail Stove and Hardware Dealers' Association will be held in St. Louis February 18 and 19. The Lindell Hotel has been selected as the convention headquarters, while the business meetings will be held in the Mercantile Club rooms, at the corner of Seventh and Locust streets. A fare of one and one-third for the round trip has been granted by the railroads, but in order to secure this rate the delegates and others attending the convention must obtain receipt from ticket agent at point where ticket is purchased. The St. Louis Committee on Arrangements is composed of F. A. Kansteiner, August Steinmeier and G. A. Pauley. The convention is expected to be the largest ever held by the association.

The meeting will be called to order at 10 o'clock on the morning of the 18th, when the president will make his annual address. This will be followed by the secretary's report, and the session will be brought to a close by a paper by Taylor Frier of Louisiana, Mo., who will have for his subject, "Association Loyalty." The afternoon session will open at 2 o'clock, the first number on the programme being an address by M. L. Corey of Argos, Ind., secretary of the National Retail Hardware Dealers' Association. Mr. Corey will be followed by H. F. Wright, Lebanon, Mo., who will read a paper entitled "Are Retailers Adjusting Their Methods to Twentieth Century Conditions?" and by Aug. Steinmeier, St. Louis, who will discuss the topic, "Is Co-operative Buying Practical?" Attention will then be given to the contents of the Question Box. The morning session of the second day will be inaugurated with a paper by Louis Hering of Blackburn, who will discuss "Store Character, or the Value of a Business Reputation." He will be followed by R. W. Shapleigh of the Norvell-Shapleigh Hardware Company of St. Louis, who will make an address. The features of the closing session in the afternoon will be a general discussion of the subject of "Co-operative Insurance," and a paper by William Kansteiner of Hannibal on "The Evolution of the Hardware Business, 1850-1901." Frederick Neudorff, St. Joseph, is the secretary of the association.

Michigan Retail Hardware Dealers' Association.

A meeting of the Executive Committee of the Michigan Retail Hardware Dealers' Association was held at the Hotel Cadillac, Detroit, on the 13th inst. The following members were present: President H. C. Minnie, Messrs. Potter of Alpena, Popp of Saginaw, Pipp of Otsego, Scott of Marine City, Harsha of Delray, and Treasurer H. C. Weber and the secretary. After an informal discussion as to the place of holding the next meeting it was unanimously decided to hold it in Detroit, August 13 and 14, at the Hotel Cadillac.

Various plans for increasing the membership were discussed and it was finally, on motion of Mr. Weber, decided to make a general offer of $1 cash for each new member obtained, the following special prizes being offered for those obtaining the largest list:

First.—A prize of $25, open to all who turn in 12 or more members, to be awarded to the one securing the highest number. Contestants for the $25 prize are barred from participating in either the $15 or $10 prizes.

Second.—A prize of $15, open to all who secure eight or more new members, to be awarded to the one securing the highest number. Contestants for the $15 prize are not allowed to participate in the $10 prize.

Third.—A prize of $10, open to all who secure five or more new members, to be awarded to the one securing the highest number.

On motion the president was instructed to appoint a committee who should have charge of the programme for the August convention and who should act in conjunction with the president and the assistant secretary. President Minnie appointed Messrs. Weber, Popp and Scott as members of that committee.

On motion the secretary was instructed to send to all members a list of the proceedings of this meeting, with that section of the by-laws relating to membership, in which he was to call especial attention to the prizes and awards for securing new members. He was also instructed to send a letter to the various hardware traveling men in Michigan calling their attention to these awards and urging them to co-operate in securing new members.

Secretary Fred. H. Cozzens, being now engaged in the wholesale hardware business in New York, stated that he could not equitably longer maintain his relations with the organization, and he therefore tendered his resignation, to take immediate effect, which was accepted after a resolution of thanks and appreciation had been unanimously passed. A further resolution, voting the sum of $100 in further recognition of his services in behalf of the retail Hardware trade, was also unanimously passed.

A resolution was also unanimously passed stating that it was the sense that the sales of builders' hardware to the consumer by the jobbers of Michigan were becoming altogether too frequent, and expressing it as the unanimous sense of the meeting that wherever such sales are made by jobber a proper commission on credit shall be given a retail dealer who does business within the normal selling district where the sale takes place. The secretary was requested to send a copy of these resolutions to all jobbers in Michigan and to request their co-operation in having it enforced.

H. C. Weber was elected secretary to fill the unexpired term of Mr. Cozzens, with authority to appoint an assistant secretary, which he at once did, appointing Clarence A. Day, assistant treasurer of the Trade Journal Association, in such capacity.

Iowa Retail Hardware Dealers' Association.

The fourth annual meeting of the Iowa Retail Hardware Dealers' Association will be held at Des Moines on February 18, 19 and 20, headquarters being at the Savery Hotel. An interesting programme has been prepared and every effort will be made by those in official charge to make the three days' gathering one of profit and pleasure. A number of papers are down on the programme, among them the following: "Benefits of Organization," by ex-President H. A. Cole, Council Bluffs, and C. R. Keating, Mt. Ayr; "Credits," by S. R. Miles, Mason City; "The Relation of Jobber and Retail Dealer," by C. F. Schmidt, Marshalltown; "Trusts in Their Relation to the Retail Dealer," by Geo. Staehle, Earlville, and "Our Competitors," by L. Lindenburg, Dubuque. There will be a Question Box as usual for the purpose of bringing up hardware matters on which the views of those in attendance are solicited. The secretary of this association is W. H. Keating, Ottumwa, who will cheerfully furnish any information desired in regard to the coming meeting.

Scheeler's Sons of Buffalo, N. Y., proprietors of the Buffalo Wire Works, have found it necessary to add to their large establishment a galvanizing and tinning plant to galvanize their product of Wire Cloth. The new plant, known as the Buffalo Galvanizing & Tinning Works, Scheeler's Sons & Charles J. Vogt, proprietors, Buffalo, is in a position to do work for the general trade.

THE LETTER BOX.

Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

ESTIMATING ON JOBS.

From W. H. D., Schenectady, N. Y.—Is it the practice of any good firms in estimating on plumbing and heating jobs to figure the goods at cost, and then add a regular percentage to determine the cost of labor? For instance, if the materials on a job cost $200, to get the cost of the labor multiply this by 25 per cent., which gives $50 for labor. Adding this to the cost of materials the total cost of the work would be $250.

Do you know of any other way of estimating besides figuring time on each of the fixtures required on the job? I have heard of firms successfully estimating on the percentage system.

Answer.—This question was submitted to a prominent New Jersey house, who make the following answer:

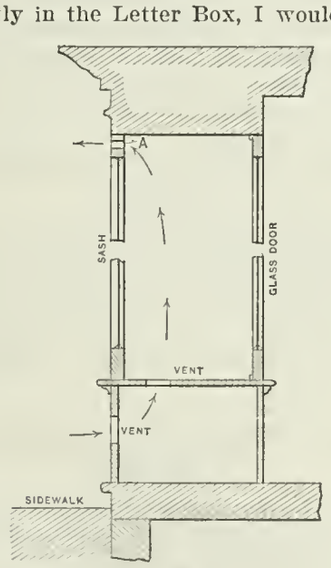
We have heard of people estimating cost of material, and where the labor was an uncertain quantity they would allow an equal amount for labor, to which a further allowance would be added for profit. For instance, in the example quoted: Cost of material, $200; labor, $200; total cost, $400, to which add the profit. We would not advise any one to pursue this course except where it is almost impossible to arrive at a fair idea of the labor. If the party estimating has no data to refer to or has not a good idea of how long it should take to do a piece of work, he had better not make any large contracts until he has had the experience.

Our method is to ascertain the time required for each class of work and to use such information as a basis in estimating. For example: Time required to fit up a sink complete, or a boiler, or water closet, or other fixtures, number of feet of cast iron pipe laid and calked complete in a day. Number of square feet of roofing in a day, &c. We have just completed some work where ratio was $4 of labor to $1 of material. We have another contract which we have estimated as $14 of material to $1 of labor. It is essential to have ability and experience behind the estimate in order to win in business.

Note.—The editor of *The Metal Worker* would be pleased to receive information regarding the methods used by its readers in different parts of the country with view to informing the trade as to the best practices in this important branch of the business.

FROST ON WINDOWS.

From F. T. D., San Francisco, Cal.—Referring to the correspondence about frost on show windows which appeared recently in the Letter Box, I would like to offer

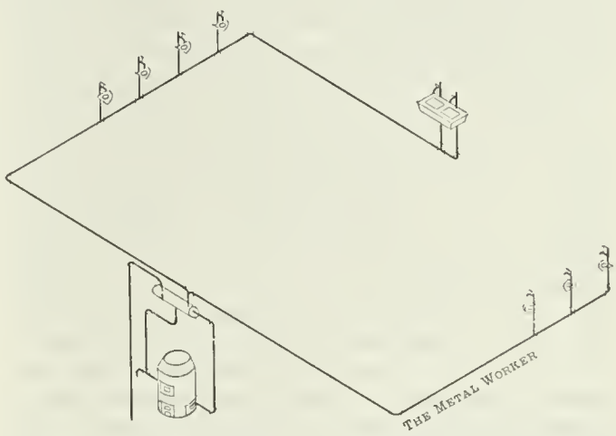


Frost on Windows.

a plan which has been tried and found a success. The sketch which I send represents a vertical section through the show window indicating the method of ventilation. In order to accomplish the purpose an 8 x 10 inch iron ventilator was inserted under the show window facing the street and a ventilator of the same size was placed in the floor of the show window. The arrows indicate the direction of the currents, the fresh air entering at the bottom and the hot air escaping at the top through holes made in the sash. These holes, indicated by the letter A, were 1 inch in diameter and were placed every 6 inches across the top of the window. The ventilators might be made with closing shutters, so as to regulate the draft. The store in question is occupied by a dealer in Japanese fancy goods and the window has four gas lights.

WANTS HOT WATER SERVICE SYSTEM.

From R. T., Newark, N. J.—I have read the letter of "E. M. C." in *The Metal Worker* of January 4, and think that his problem is a comparatively simple one. I suppose that hot water will be drawn from this system for



Wants Hot Water Service System.

a comparatively short time during the day, and not, as in a residence, more or less continuously. On this account a small heating coil in the furnace and a large boiler would be best adapted for the purpose. If the heating coil was made large it would probably overheat the water and induce the generation of steam, causing a rumbling noise in the boiler; while if a larger boiler and small coil were used it would provide for the storage of plenty of hot water to be used when needed. A small heating coil in the furnace, under the conditions assumed, would have plenty of time to heat all the water needed, as hot as would be required. For that reason I recommend at least a 40-gallon boiler, and preferably one having 50 gallons capacity or more, with a water heating pipe 1 inch in diameter, only long enough to run directly across the fire pot at the top. This would not interfere with adding fuel or clearing the fire, and would expose enough surface to furnish all the hot water, if the conditions are as I assume. Owing to the large number of fixtures and their location being in an opera house all are likely to be used at the same time. It would be better, therefore, if the main hot water service pipe was ⅝ or ¾ inch in size, and the branches for supplying the different fixtures were ⅜ inch. If the same size of pipe was used throughout, the fixtures at the end of the service line would in all probability be supplied with a very sluggish flow of water.

MEANING OF THE TERM "SPELTER."

From A. R. Y., Trenton, N. J.—I should like to know the difference between the terms "spelter" and "zinc," which seem to be applied indifferently to the same metal, and shall be glad if you can give me this information through the Letter Box.

Answer.—Spelter is the commercial name of zinc. It is a modification of the German word *spialter*, which formerly denoted the alloy of pewter composed of lead and tin with a slight admixture of antimony, copper and bismuth. Zinc was first produced commercially in Germany, and when put on the market about 200 years ago went under the old German name. The name zinc is a variation of *zinn*, which is the German word for tin.

POOR DRAFT IN A STONE CHIMNEY.

From H. & W., Orange, N. J.—In *The Metal Worker* of January 18 "F. H. W." wants to know how to cure a poor draft in a stone chimney. The sketch shows an air tight cellar, and, if this is so, he should make an opening through which the air can enter the cellar. He can prove this by opening the cellar door and keeping it open for two or three hours while trying to make the fire burn. If there is no cellar door he should make a hole through the foundation walls, for air must go into the cellar if it is to enter the fire and pass up the chimney and come out. If this is done without success he should break into the chimney at or near the floor and build a fire of kindling wood until the chimney is warmed up clear to the top. The case is a hard one if success does not attend experiment along these lines. A stone chimney on the outside of a house is cold and damp; besides it is apt to be rough on the inside, all of which tends against a perfect draft. The ideal chimney is located on the inside of a house, is built of brick and lined with chimney tile, straight and smooth, warm and dry, with all joints tight, and it is bound to work unless interfered with by trees and conditions on the outside.

When "F. H. W." has tried the suggestions given and those received from other readers, let him be grateful and tell of his success to the readers of *The Metal Worker*. Trying to help a man and never knowing whether the assistance given leads to success is very unsatisfactory to those who give it. There is a special difficulty in the use of cast iron pipe in a chimney. After it has been in use a little while it will clog up with rust and soot, and it is impossible to keep it clear. The flakes of iron dislodged by the smoke acids will choke up the cast iron pipe, under some conditions, in three or four months. The obstruction can be removed by an iron pole attached to a chain and rope. We have had such experience with a better chimney than that described by "F. H. W."

From F. K., Chicago.—In reply to the inquiry of "F. H. W.," in *The Metal Worker* of January 18, relative to a poor draft in a stone chimney, I would say that I had a job of this kind and made the chimney dry by the following experiment: I found that there was not enough fresh air in the cellar to produce perfect combustion and therefore made a pipe leading from the ash pit through to the outside of the building, thereby supplying the fire with fresh air. This experiment was a perfect success. "F. H. W.'s" trouble may arise from the same cause. All I ask of him is that he will let me and the other readers of *The Metal Worker* know how he succeeds.

From J. W., Brooklyn.—I notice the letter of "F. H. W." in *The Metal Worker* of January 18 and would suggest that if he connects a 6-inch pipe to the ash pit of the boiler and extends it to the outside of the building on the side of the prevailing winds, and sees that the outlet on the top of the chimney is no larger than a 9-inch smoke pipe, he will secure a proper draft, provided he keeps the ash pit and feed doors closed.

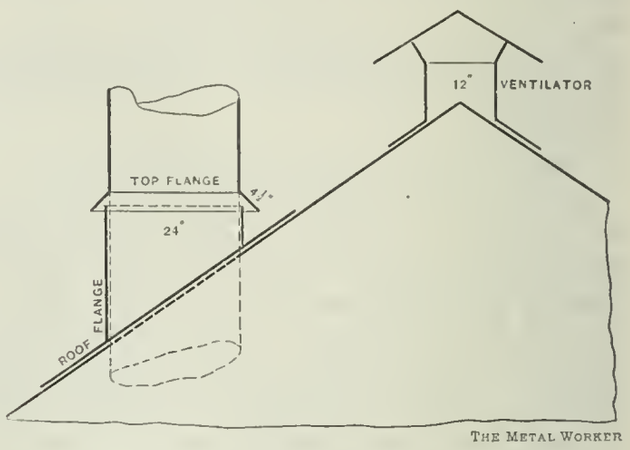
CONSTRUCTION OF WATER HEATER.

From M., Sheldon, Vt.—Would it be advisable to provide a tank in the upper part of a house for carrying a supply of water to protect a pipe water heater placed in a range and connected with a range boiler? The fixtures are now supplied with water from a reservoir, and in case this supply should be stopped from any cause the coil in the range might be destroyed from heat, so as to be of no further use, even if no other damage was done.

Answer.—The protection suggested is not adopted in connection with many plumbing systems where the supply might be shut off temporarily. In case the supply were shut off the range boiler would be filled with water which would circulate through the pipe coil and prevent its destruction. If the stove was run hard steam might be generated or the vapor from the hot water might escape from the faucets and eventually empty the boiler, when the destruction suggested might occur. If there is a strong probability of the supply being shut off for a considerable time there can be no doubt as to the advisability of providing the supply tank. This tank might be supplied from the regular water service main, carrying the pipe up and bending the end over the top of the tank, so as to discharge into it. This tank should be connected with the regular supply pipes to the different fixtures, so that the water could be occasionally drawn off to prevent stagnation when the regular supply is available.

COST OF FLANGES AND VENTILATOR.

From R. & B., Medaryville, Ind.—We should like to ask the readers of *The Metal Worker* to tell us their methods of arriving at the prices to be charged for making out of No. 24 galvanized iron a 24-inch roof flange to go



Cost of Flanges and Ventilator.

around a 24-inch smokestack, and also of the small flange riveted on the smokestack just above the roof flange to keep the rain from going between the roof flange and the smokestack.

Kindly also tell method for finding price to be charged for a 12-inch ventilator. The flange and the ventilator are both to go on a roof of one-third pitch.

SUGGESTIONS FOR IMPROVING "THE METAL WORKER."

From H. & W., Orange, N. J.—We would suggest that at the head of the Letter Box column you put the following: "It is especially desired and considered as a part of the agreement that any one asking for information to solve the puzzling problems which arise in transacting business and doing work shall, upon successfully solving the problem through the aid given in the Letter Box, in return for the assistance received, write an account of the method of securing success for the benefit of others who may need assistance and for the satisfaction of those who have given the aid sought."

ILLUMINATING GAS FROM A COAL STOVE?

From M. C. R., Dayton, Ohio.—I have heard that there is a coal heating stove which is made to furnish gas for illuminating the room in which it is placed. Can you give me any idea as to who manufactures such a stove? I should be very thankful for any information the readers of *The Metal Worker* can furnish on this point.

MATERIAL FOR MARKING GALVANIZED IRON.

From J. H. F., Burlington, Iowa.—We should be glad of any information as to the best materials and process for marking galvanized iron which must be exposed to the weather. We have used various paints and varnishes in stenciling goods that we manufacture, but want to know if there is any material that we can use for this purpose that would be more expeditious and equally weather proof. Can rubber stamps be used in applying any material that would be weather proof?

TRADE REPORT.

MARKET SUMMARY.

Pig Tin, after fluctuations, remains at last week's price level.

Copper is dull and a shade lower.

Pig Lead is dull and unchanged.

Spelter continues dull and without change in price.

Antimony is unchanged.

Nickel remains at former prices.

Aluminum is active and unchanged.

Tin Plates are moving in fair volume at former prices.

Sheets are still in heavy demand; jobbers' prices are rather lower.

Sheet Copper has been reduced 2c. per lb.

Scrap Metals are more active and firm.

Pig Iron is strong and active, with upward tendency.

Hardware is moving in increased volume, with prices well maintained.

Cast Iron Soil Pipe and Fittings are not advanced in price, but higher prices are looked for.

Wire Nails are stronger, with moderate demand.

Cut Nails are in fair demand at former prices.

Window Glass is dull, with future of prices uncertain.

White Lead is moving well; prices are unchanged.

Linseed Oil is firm and may go higher.

Spirits Turpentine was advanced 4c. per gallon.

METAL MARKET.

NEW YORK, January 24, 1902.

Pig Tin.—Under manipulating influences, the London Tin market advanced considerably in the early part of the week, and the rise there had a stimulating influence on this market, although the advance here was in no wise commensurate with the rise in London. A reaction took place later in the week both here and there, bringing prices down to about the level recorded in our last report. Jobbers quote Straits Pig in small lots at 24½c. to 25c. per lb. The volume of business is very light, and the market, as a while, is dull and tame, so far as transactions are concerned. Arrivals here during the last few days were very heavy, and to date this month aggregate 2590 tons.

Copper.—Prices of Copper have declined a shade further. It is said that a fair business in prompt delivery has been transacted at the lower figures. It is further reported that the large producers are following up inquiries very closely, and shading any quoted figure in order to capture orders. At the present time there are really no established market rates. Those officially quoted by the New York Metal Exchange merely indicate a basis toward which producers' transactions approximate. Business, in short, is being done on a hand to mouth basis, and is probably small in the aggregate. Lake Ingot in small lots is quoted by jobbers at about 11¾c. to 12c. per lb., and Casting Copper at 11¼c. to 11½c.

Sheet Copper.—In another column details are given regarding the reduction in the price of Sheet Copper, which was announced by the manufacturers on Thursday. This is the second reduction since the beginning of the year, and it brings the price of the material down 5c. below the figures which ruled for some time before the first reduction, made on January 2. While it is too early as yet to note any increase in the demand for Sheet Copper, it is regarded in the trade as certain that this latest action of the manufacturers will have the effect of greatly stimulating the demand, which has been of very light proportions ever since the disturbance in the Copper market began. As reported for some weeks past, consumers have been buying strictly from hand to mouth, and stocks of Sheet Copper in their hands are known to be unusually light. The present base price of Sheet Copper is 16c. per lb.

Pig Lead.—The market for Pig Lead continues very dull and uninteresting. Prices are unchanged and firm and the volume of business shows no improvement. American Pig in small lots is quoted by jobbers at 4.40c. to 4½c. per lb. St. Louis advices indicate a quieter tendency in the Pig Lead situation in that market, and a smaller volume of business is said to have been transacted in the past week at former figures.

Spelter.—The market is very dull and prices are a shade lower. The demand is referred to as exceedingly light. Good Western brands in small lots are quoted by jobbers at 4⅝c. to 4¾c. per lb. It is generally conceded that the latest attempt to consolidate has proved a failure. The options have expired and nothing further is being done in the matter at present. St. Louis advices report a lighter run of transactions in Spelter in that market, with no change in prices.

Sheet Zinc.—The conditions in this metal are without change. Jobbers quote 600-lb. cask lots at 6¾c. and small quantities at 7¼c. per lb.

Antimony.—There is no change in this metal. Hallett's and U. S. in small lots are quoted at 8¼c. to 8¾c. per lb., and Cookson's at 10¼c. to 10¾c.

Nickel.—The market is unchanged, small lots being quoted on a basis of 60c. to 65c. per lb.

Aluminum.—The market for Aluminum keeps up in good volume. Prices are without change. Small lots of No. 1 Ingot, guaranteed 99 per cent. pure, are quoted at 37. per lb., and 100-lb. lots at 35c.

Tin Plates.—Conditions in this market remain without any change worthy of note. The large buyers are reported to be covering their wants for the first half of the year. The American Tin Plate Company announce that they are unable to take any orders whatever for January delivery. The demand from smaller consumers is referred to as very satisfactory for the season, and jobbers' prices are pretty firmly held, there being no surplus stocks of any kind of Plates. American Bessemer Coke Plates, IC, 14 x 20, in small lots, delivered at New York and corresponding points rule at about $4.90 to $5.15 per box.

Sheets.—A fairly large volume of new business in both Black and Galvanized Sheets is reported and the market is strong. Notwithstanding the increased capacity provided by the starting up of new mills the manufacturers of Sheets are still unable to keep pace fairly with the demand. The mills have been hampered in many instances by the difficulty of getting sufficient fuel and raw material, owing to the lack of transportation facilities, and some of them are badly handicapped on this account, which tends to make them still more backward in their deliveries. The retail trade in both Black and Galvanized Sheets in New York City is referred to as keeping up in good volume, but stocks are not quite so restricted as they were a few weeks ago. Consequently jobbers' prices have eased off to some extent. Small lots of No. 27 One Pass Cold Rolled Soft Steel Black Sheets are quoted at about 3.95c. to 4c., and Galvanized Sheets at 67½ and 5 to 70 per cent. off the list.

Chicago advices are as follows: The independent mills are feeling the usual midwinter slackness in the demand for standard sizes. The mills making a full range of sizes and qualities are picking up considerable business, however, so that trade cannot be called dull. It is, in fact, remarkably good for this time of the year. Jobbers have slightly reduced the store price and small lots of No. 27 Black Sheets are quoted at 3.35c. to 3.45c., and Galvanized at 70 and 2½ to 70 and 5.

Old Metals.—The demand for Scrap Iron is very active and prices are firm. Old Brass and Copper are also more active, with prices a little firmer, if anything.

Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper	per lb.	9½c.
Light and Tinned Copper	per lb.	7¾c.
Heavy Brass	per lb.	7¼c.
Light Brass	per lb.	5¾c.
Lead	per lb.	3⅝c.
Tea Lead	per lb.	3½c.
Zinc	per lb.	3 c.
No. 1 Pewter	per lb.	15¾c.
No. 2 Pewter	per lb.	8 c.
Tin Plate Scrap, per gross ton		$5.00
Wrought Iron Scrap, per gross ton	$11.00 to	11.50
Heavy Cast Scrap, per gross ton	10.50 to	11.00
Stove Plate Scrap, per gross	8.00 to	8.25
Burnt Iron, per gross ton	5.50 to	5.75

THE PIG IRON MARKET.

New York.—There has been a moderate amount of buying in this district, and the market continues firm. We quote for Northern Irons: No. 1, $16.50 to $17.50; No. 2 X, $16 to $16.50; No. 2 Plain, $15.50 to $16; Tennessee and Alabama brands, No. 1 Foundry, $16.25 to $16.75; No. 2 Foundry, $15.75 to $16; No. 1 Soft, $16.25 to $16.75; No. 2 Soft, $15.75 to $16; No. 3 Foundry, $15.25 to $15.50; No. 4 Foundry, $14.75 to $15.

Chicago.—Large transactions are reported for delivery in the third quarter of the year, quite a number of contracts being placed for lots of 3000 to 5000 tons by manufacturers of Radiators, Stoves and General Castings. Negotiations are in hand for further large quantities, showing that the buying movement has not yet ended. A sharp demand exists for spot lots of Iron, on which premiums are freely paid above prices ruling on contracts. The supply of Iron for quick shipment, however, is very small, and can now only be obtained from a few Southern or Lake Superior Charcoal furnaces. The situation has improved with respect to the Coke supply. The supply of Foundry Pig Iron, however, does not show any expansion. We quote as follows:

Lake Superior Charcoal	$19.50 to	$20.50
Local Coke Foundry, No. 1	16.50 to	17.00
Local Coke Foundry, No. 2	16.00 to	16.50
Local Coke Foundry, No. 3	15.50 to	16.00
Local Scotch, No. 1	16.50 to	17.00
Ohio Strong Softeners, No. 1	19.50 to	20.00
Southern Silvery, according to Silicon.	16.90 to	17.15
Southern Coke, No. 1	16.40 to	16.65
Southern Coke, No. 2	15.65 to	15.90
Southern Coke, No. 3	15.15 to	15.40
Southern Coke, No. 1 Soft	16.40 to	16.65
Southern Coke, No. 2 Soft	15.65 to	15.90

Philadelphia.—It is difficult to secure good brands of Iron at the prices ruling a week ago. Most sellers of No. 2 X Foundry Iron demand $17.25, but some sales are made at $17.50 and at a still higher figure, the outside rate being for deliveries during the first quarter of the year. The range of prices at present is probably about as follows for Philadelphia and nearby deliveries: No. 1 X Foundry, $18 to $18.50; No. 2 X Foundry, $17 to $17.75; No. 2 Plain, $16.50 to $16.75.

Pittsburgh.—Very little Iron is to be had for shipment this side of July, and very high prices can be obtained by furnaces that can spare any Iron for shipment within the next three or four months. No. 2 Foundry Iron for second quarter has sold at $16.50 to $16.75, Pittsburgh. No. 1 rules at $17 to $17.50, depending on delivery.

Cincinnati.—There has been little change in the Pig Iron situation during the week. It is recognized as a fact that all the Iron which can be safely counted on for delivery up to July is booked on contracts. There has been quite a considerable amount of selling for the last half of the year, but the disposition of buyers now is rather to go slow on purchasing for extended delivery. The amount of business done during the past week was rather small. Quotations are without change. If there was any Iron for immediate delivery it would, of course, demand a premium. The situation, on the whole, is strong and healthy, the only trouble being the car shortage, which, while somewhat easier, does not really show very much betterment. We quote f.o.b. Cincinnati:

Southern Coke, No. 1	.... to	$15.25
Southern Coke, No. 2	.... to	14.75
Southern Coke, No. 3	.... to	14.25
Southern Coke, No. 4	.... to	13.75
Southern Coke, No. 1 Soft	.... to	15.25
Southern Coke, No. 2 Soft	.... to	14.75
Southern Coke, Gray Forge	.... to	13.75
Southern Coke, Mottled	.... to	13.75
Ohio Silvery, No. 1	$16.25 to	16.75
Ohio Silvery, No. 2	15.75 to	16.25
Lake Superior Coke, No. 1	.... to	17.10
Lake Superior Coke, No. 2	.... to	16.60
Lake Superior Coke, No. 3	.... to	16.10

St. Louis.—The good inquiry and demand which have been ruling in this market for some time continue. Evidently, requirements are not on a large scale, and it looks as though the wants of the larger local concerns were provided for some time ahead. The furnaces are not in a position to comply with orders for quick delivery in any round lots. It is thought that prices will hold at present level for some time. We quote as follows for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry	$15.75 to	$16.00
Southern, No. 2 Foundry	15.25 to	15.50
Southern, No. 3 Foundry	14.75 to	15.00
Southern, No. 4 Foundry	14.25 to	14.50
No. 1 Soft	15.75 to	16.00
No. 2 Soft	15.25 to	15.50

CHICAGO REPORT.

Scrap Iron and Steel.—Business is excellent, the demand easily absorbing the supply now coming in. We quote dealers' buying prices for carload lots, Chicago delivery, as follows:

	Per net ton.	
Country Wrought Scrap	$11.00 to	$11.50
Machinery Cast	10.50 to	11.00
Malleable Cast	10.00 to	11.00
Stove Plate (free from burnt)	8.00 to	8.50
Burnt Iron and Grate Bars	5.50 to	6.00
Sheet Iron and Hoops	6.00 to	7.00
Plow Steel	.... to	7.00
Breaking Stock	9.00 to	10.00
No. 2, such as Shovels, Hoes, &c	.... to	7.00
Old Boilers—whole (Iron)	6.50 to	7.00
Old Boilers (Iron) cut in single Sheets and Rings	10.00 to	11.00
Old Gas Pipes and Boiler Tubes	10.50 to	11.00
Cast Borings	4.50 to	5.00
Turnings	9.50 to	10.00
Horseshoes	12.00 to	....

Old Metals.—At last consumers of Old Copper and Brass are attracted by the low prices and trade is heavy. The demand has slightly stiffened the market on these commodities. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	9½c.
Copper Bottoms	8¼c.
Copper Clips	9 c.
Red Brass	9 c.
Yellow Brass	7 c.
Red Brass Borings	8½c.
Yellow Brass Borings	6 c.
Light Brass	5¾c.
Pipe Lead	3.50c.
Tea Lead	3.25c.
Zinc	2¾c.
Tin Foil	18 c.
Pewter, No. 1	16 c.
Pewter, No. 2	14 c.

Old Rubber.—The movement is light and prices are weak. Dealers' buying prices are as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	42.50	.....
Rubber Shoes	....	6½c.
Rubber Car Springs	....	5½c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6¾c.
Black Rubber	....	4¼c.
White Rubber	....	8 c.

Rags.—Dealers quote buying prices of good Country Mixed Rags, Chicago delivery, at 75c. to 85c. per 100 lbs. in any quantity.

Anthracite Coal.—The demand is very much better. Local stocks are in good shape, permitting prompt shipments to be made. Prices are unchanged, as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis.	5.75	6.00
St. Louis	6.20	6.45
Kansas City, Mo.	8.25	8.50

The Crane & Ordway Company, St. Paul, Minn., have leased a large building in Duluth and will shortly open a wholesale house for the purpose of carrying a stock of Mining, Mill and Lumbermen's Supplies, Ship Chandlery, Steam Pumps, Hoists, Engineers' Supplies, Belting, Piping, &c. The company withdrew from the Duluth wholesale field some years since, but believe now that the time has arrived when the condition of trade in the territory tributary to Duluth warrants the re-establishment of this connection. The resident manager of the company will be Charles A. Payne. They will for the present cover Northwestern Wisconsin and Northern Minnesota with their traveling salesmen.

HARDWARE TRADE.

Since the middle of the month there has been an evident increase in the volume of business, and the machinery for the production and distribution of goods is now in full operation. In many lines manufacturers are kept busy on their customers' orders, without much opportunity to accumulate stock. They report the inquiries from the trade as indicating a large volume of business during the next few months. Travelers generally are out and the result of their activity is the sending in of orders which are referred to as very satisfactory in volume. The trade are disposed to purchase a little earlier than sometimes, in view of the tone of the market, the excellent condition of current business and the possibility that there may after a while be difficulty in obtaining prompt shipments. The changes in price for the week under review are few and for the most part comparatively unimportant. The stiffening in the Nail and Wire market is having an excellent effect on the trade in general. Manufacturers express some annoyance from delay in obtaining raw material, principally on account of the shortage of cars. The movement of heavy lines is also interfered with from the same cause. The matter of organization among the retail trade will be brought to the front during the coming month, when so many of the associations hold their annual meetings, and questions relating to the welfare of the trade are naturally attracting some attention at this time. The subject of consolidation of jobbing interests is occasionally broached, principally in an interrogatory way. While it is understood that the project is not abandoned and may possibly be awaiting consummation in some form very different from the comprehensive scheme that was originally proposed, it is impossible to obtain anything definite in regard to the plans or operations of its promoters. In the meanwhile there is some talk of consolidation among manufacturers in lines in which up to the present there has been little indication of harmony or a disposition to work together.

NOTES ON PRICES

Cast Iron Soil Pipe and Fittings.—A meeting of the manufacturers of Cast Iron Soil Pipe and Fittings, which was held at The Arena, New York City, on Wednesday, January 22, resulted in a reaffirming of the previous prices. It is said that while the leading interest in this industry, together with several of the independent manufacturers, were in favor of an advance in prices, a number of the Western manufacturers and one of the Eastern manufacturers exhibited such opposition to an advance at the present time that action upon prices was deferred to some future date. The consensus of opinion of all the manufacturers being that it would probably be advisable to make an advance before long, it is felt that the matter is merely postponed. The Western manufacturers were of the opinion that the entire business should be conducted on a basis similar to that now in vogue among the manufacturers of Kitchen Range Boilers—that is to say, that the Soil Pipe manufacturers should market their wares and sell goods to the jobbing trade on a rebate system. This the Eastern manufacturers were not prepared to accept. It is understood that a compromise of the matter was arrived at whereby Western manufacturers and Eastern manufacturers are to sell goods within a given territory on this basis. All the sales of Cast Iron Soil Pipe and Fittings will be conducted as heretofore in the Eastern sections of the country. This, we understand, is due to the fact that the Eastern jobbers are not in favor of the rebate scheme. A committee was appointed which will report in the early part of February on the new schedule of discounts, which will equalize the selling prices all over the entire country. In the meantime it is understood among the manufacturers that they are to restrict their taking of orders to certain limits. No blanket orders are to be taken. All orders are to be accepted for immediate shipment, and no orders are to be accepted unless accompanied by specifications. Little doubt is felt in the trade that an advance in Cast Iron Pipe and Fittings will take place within a short time.

Plumbers' Brass Work.—The new prices issued by the Manufacturers' Association of Plumbers' Brass Work at the meeting which was held in Pittsburgh on the 14th inst. do not show such a radical decline as was expected. The prices follow the changes suggested by the secretary of the association, William T. Doyle, in his letter to the manufacturers, which was issued under date of January 2. In that letter Mr. Doyle showed that 1 cent per pound advance in the price of Copper made a difference of but 1½ per cent. in the cost of the finished product, and that a reduction of 4 cents per pound in the price of Copper made a reduction of but 2 8-10 per cent. per pound in the price of the finished product, which gave, as a result, an average decrease of 6 per cent. in the price which had been previously in effect. The actual average decline is very close to 7½ per cent. Finished Ground Key Bibs and Stops, Rough T. & L. Handle Stops, Shower Stops, Flange and Handle, Compression Work, such as Bibs for Lead and Iron Pipe, Urinal Cocks, Sill Cocks, Stops and Stops and Wastes, Ball Cocks, Basin Cocks, all underwent a decline of 10 per cent. Rough Ground Key Bibs, Round Way Stops, "H" Pattern Round Way Stops, Hydrant Cocks, Corporation Cocks, Plain Bibs, Flanged for Iron Pipe and Flange and Thimble Compression Competition Bibs, Compression Low Down Basin Cocks, Compression Double Bath Cocks, and the entire line of Fuller work underwent a change of but 5 per cent. Self closing work of all styles did not undergo any change whatever. The general Brass Goods market is dull. There is not a very strong demand for them at the present time, and the jobbing trade are holding off, thinking that the market has not yet reached bottom. The manufacturers feel confident that the Copper market will react within a short time, and they do not want to have to fight their way back to profitable prices. They claim that the market for Brass work has been so cut up in recent years that no one has made money, and this claim seems to be well founded, inasmuch as one of the largest New England manufacturers is now in the receiver's hands, one large Western manufacturing concern is now entirely out of business, and two of the Western manufacturers had to consolidate in order to keep their heads above water.

Sheet Copper.—Under date of January 23 the manufacturers of Sheet Copper announced a further reduction in price, amounting to 2 cents per pound. This reduction has been expected by the trade in consequence of the continued decline on Raw Copper. The present base price of Sheet Copper is 16 cents per pound; Cold Rolled Sheets, 17 cents; Cold Rolled Polished Sheets, 18 cents; Planished Sheets, 19 cents, and Bottoms, Pits and Flats, 20 cents per pound. It is the general impression that this latest reduction brings the price of Sheet Copper to as low a figure as it is likely to touch for some time and a considerable increase in the demand for this material is looked for, as consumers for some time past have been hesitating to buy anything beyond the limits of their actual current needs, in anticipation of the lower prices that have now been developed.

Wire Nails.—Since the meeting last week of outside manufacturers of Wire Nails the market has shown considerable strength. It is stated that the leading interests are refusing to go below the minimum price decided upon. While an immense business was booked for future delivery at prices recently current, many who were waiting for further declines in prices did not order before the advance. During this waiting policy, on the part of some, stocks in the hands of merchants throughout the country have been steadily reduced, and they are now thought to be quite light. The local demand for Wire Nails in the New York market is light. Small lots from store are quoted at $2.25 to $2.30 per keg.

Cut Nails.—For the season, the demand for Cut Nails is considered satisfactory. Representatives of mills are adhering to the price of $2.25 for Nails from store, and jobbers in the New York market are asking the same

price generally, although in some cases they are selling 2 cents below these figures.

Window Glass.—No understanding has been reached between the various interests in the Window Glass market. A meeting of the American Company and the Federation Association with the Jobbers' Association was to be held at the end of this week, when the future policy will probably be disclosed. This will be either to uphold the Glass market or encourage a rate war. There is very little local demand for Glass, as buyers are all waiting until some definite action has taken place.

White Lead.—A considerable quantity of White Lead in Oil is reported as being distributed by manufacturers, and the impression prevails that the demand will be large this year. Reports of concessions of ¼ cent per pound or more, according to brands, are persistently circulated. White Lead in Oil, in lots of less than 500 pounds, is quoted at 6½ to 6¾ cents per pound.

Linseed Oil.—Crushers are trying to force up prices of Oil, and it is possible that the price may be advanced materially in or before February. It is said that the Seed market is being manipulated for the purpose of advancing Oil. The buying is restricted to present necessities, the market being firm at about previous quotations. City Raw, in small lots, is quoted at 62 to 63 cents per gallon.

Spirits Turpentine.—During the week Turpentine has advanced 3 cents from the quotations given in our last report. This has checked buying to some extent. The local market holds firm on reports of a strong Southern market. Turpentine in small lots is quoted at 44 to 44½ cents per gallon.

TRADE NOTES.

THE EVANS STAMPING & PLATING COMPANY of Taunton, Mass., have been incorporated with a capital of $30,000. Edwin H. Evans is the president and Charles E. Evans treasurer of the concern.

POLISHERS' AND PLATERS' SUPPLIES, in the shape of Chemicals and Compounds, form the subject matter of a neat circular that is being sent out by the Harshaw, Fuller & Goodwin Company of 100 William street, New York, and the Electric Building, Cleveland, Ohio. A special leaflet calls the attention of the trade to the company's Nickel Anodes and Nickel Salts.

DEMINICO & GOETTLER have purchased the North American Aluminum Works, at 176 Centre street, New York, and will manufacture Aluminum Novelties.

THE INTERNATIONAL ACHESON GRAPHITE COMPANY, Niagara Falls, N. Y., are sending out an artistic publication of 20 pages in the interests of their Acheson Graphite Electrodes, for use in electrolytic and electro metallurgical processes.

SCHULMAN & GARBER, who have been established in Minneapolis since 1884 as dealers in Scrap Iron and Metals, have removed from 1328 Washington avenue, North, to 329 Tenth avenue, South, where they have larger quarters.

THE AKRON MFG. COMPANY, Akron, Ohio, have received a contract from the Carrara Paint Company, Barberton, Ohio, for 800,000 Tin Pails per year for five years. The contract will necessitate the addition of new machinery and a larger force.

F. E. MYERS & BRO., Ashland, Ohio, manufacturers of the Myers Pumps and Hay Tools, have just completed the erection of a large raw material storehouse. It is a three-story brick building, 50 x 160 feet, of modern architecture. They are also increasing the capacity of their power plant by placing in it a 400 horse-power automatic high speed engine, a battery of Wilcox & Babcock boilers, two extra large dynamos and additional motors. These additions will make their power, light and storage capacity nearly one-third greater than heretofore.

WE are indebted to Lyon, Conklin & Co., Baltimore, Md., for one of the handsome desk blotters they are distributing to the trade. Beside the "pen" picture on the celluloid cover, the company take the occasion to announce to the trade their various brands of guaranteed Roofing Tin.

THE plant of the Hopson-Haftencamp Company, manufacturers of Roofing and Supplies, Grand Rapids, Mich., was destroyed by fire on January 21 with a loss of $25,000 on the building and $50,000 on stock and machinery. The damage is partly covered by insurance.

THE disappearance of the old established Tin Plate and Metal house of A. A. Thomson & Co., who have been established on Water street, New York City, for the past 40 or 50 years, leaves quite a gap in the local metal trade. The company went out of business on January 1.

WE have received with the compliments of E. L. Parker & Co., dealers in Tin Plate, Sheet Iron, Metals, Tinners' Supplies, &c., of 201-203 South Charles street, Baltimore, Md., a copy of the dainty calendar for 1902 which they are distributing to their friends. The calendar is arranged on four cards, each covering one quarter of the year, the decorations on each card being artistic representations of the pink and white clover blossoms. The calendar cards are provided with a silk ribbon for hanging. Accompanying the calendar is a folder calling attention to E. L. Parker & Co.'s special brands of high grade Roofing Plates.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED JANUARY 24, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 98% Pure), in ingots for remelting.
Small lots.....₩ lb. 87¢
100-lb lots.....₩ lb. 85¢

Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than.....	6-in. ₩ lb.	14-in. ₩ lb.	24-in. ₩ lb.
And including.....	14-in	24-in.	30-in.
Nos. 13 to 19.....	$0.42	$0.44	$0.47
" 20.....	.44	.46	.49
" 21 to 23.....	.46	.48	.51
" 24.....	.48	.50	.53
" 25.....	.47	.51	.54
" 26.....	.47	.54	.59
" 27.....	.48	.57	.62
" 28.....	.48	.57	.64
" 29.....	.49	.60	.69
" 30.....	.50	.64	.77

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb. 10¼@10½¢
Hallett's.....₩ lb. 8¼@8½¢
U. S.....₩ lb 8 @8½¢

Brass, Roll and Sheet..... 30%

Conductors—Corrugated.

Round or Square.—

Galvanized ½ or more. N'st'd.....70&5%
" Not Nested.....70&2½%
" Plain Round, ½ or more, Nested.....70&5%
Galvanized, Plain Round, Not Nested. 70&2½%

Spiral Riveted.

Galvanized.....40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—

See *Strainers, Conductor.*

Copper—

Lake Ingot.....11¾@12 ¢
Casting.....11¼@11½¢
Sheet and Bolt.....16¢ ₩ lb basis
Cold Rolled Sheets.....17¢ ₩ lb basis
Cold Rolled and Polished Sheets..... 18¢ basis
Planished Sheets.....19¢ basis
Bottoms, Pits and Flats....₩ lb 20¢ basis

Eave Trough, Galvanized

Territory.	L. C. L.	
Eastern.....	75&10%	Carloads extra 12½%
Central.....	75&7½%	
Southern.....	70&12½%	
S. Western.....	70&10%	

Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Eastern List.

Tin.....80%
Galvanized.....80%
Perfect Elbows.....40%

Stove Pipe—

Four-Piece

	4	4½	5	5½	5-inch.
No. 1.	$0.80	.85	.90	1.00	1.05 per doz.
No. 2.	.65	.70	.75	.80	.85 "
No 3.	.60	.63	.65	.70	.80 "

Elbows and Shoes—

Galvanized.....60%

Gasoline—

See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, C. R., Soft Steel.	R. G. Cleaned.
Nos. 14 to 16....	₩ lb. 3.60....	3.65¢
Nos. 18 to 21.....	₩ lb. 3.70....	3.75¢
Nos. 22 to 24.....	₩ lb. 3.80....	3.85¢
Nos. 25 and 26...	₩ lb. 3.90....	3.95¢
No. 27	₩ lb. 4.00....	4.05¢
No. 28	₩ lb. 4.10....	4.15¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb 11@14 ¢
Do. Stained.....6@10½¢
Patent Planished. ⅞ lb A. 12¢; B, 11¢ net

Galvanized.

Nos. 10 to 16.....	₩ lb, 12¢	67½&5@67½% off
Nos. 17 to 21.....	₩ lb, 13¢	
Nos. 22 to 24.....	₩ lb, 14¢	
Nos. 25 to 26.....	₩ lb, 15¢	
No. 27.....	₩ lb, 16¢	
No. 28.....	₩ lb, 17¢	
No. 29.....	₩ lb, 19¢	
No. 30.....	₩ lb, 21¢	

36 in. 1¢ ₩ lb higher.

Lead—

American Pig.....4.45@4½¢
Bar.....5@5½¢
Pipe.....6½¢.....2½% off
Tin Lined Pipe.....12½¢.....20% off
Block Tin Pipe.....35 ¢.....20% off
Sheet Lead.....7¼¢.....20% off
Old Lead in exchange, 3¾¢ ₩ lb.

Mitres, Eave Trough—

See *Eave Trough Mitres.*

Nickel—

Per lb.....60@65¢

Paints, Oils, &c.—

Leads—

Lead, American White, in Oil:
Lots of 500 lb or over.....6¼ @ 6½
Lots less than 500 lb.....6½ @ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price..... @ ⅛
Lead, White, in oil, 13½ lb tin pails, add to keg price..... @ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price... @ 1½
Lead, White, Dry in bbls.....5¾ @ 6
Lead, Red, bbls., ½ bbls. and kegs:
Lots 500 lb or over..... @ 6
Lots less than 500 lb ..... @ 6½

Oils—

Linseed, City, raw.....₩ gal.....62@63¢
Linseed, City, boiled.....64@65¢
Linseed State and West'n, raw..60@61¢

Spirits Turpentine—

In Southern bbls.....44 @44½¢
In machine bbls.....45 @45½¢

Putty—

In bulk.....$1.25
In bladders..... 2.25
In cans 12 lb to 25 lb..... 2.25
In cans 1 lb to 5 lb..... 3.25

Petroleum Products—

In Barrels (Barrel included)

Stove Gasoline.....₩ gal. 10½@11¢
Kerosene.....₩ gal. 12@13¢

Pipe, Drain..... .....40%

Pipe, Spiral—

See *Conductors.*

Registers—

List Sept. 2, 1901.

Black Japanned.....60&10@60&10&5%
White Japanned.....60&10@60&10&5%
Nickel Plated.....60&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze..... 60&10@60&10&5%
Electroplated in Brass, Bronze or Copper..... ...60&10@60&10&5%
White Porcelain.....60%
Solid Brass and Bronze Metal.....50%

Roofing Material—

1 Ply Tarred Paper. ₩ ton. $28 00@30.00
2 Ply Tarred Paper...₩ roll, 108 sq. ft. 50@55¢
3 Ply Tarred Paper..₩ roll, 108 sq. ft. 75@80¢
Slater's Felt.....roll 500 sq. ft., 50@60¢
Roofing Pitch.....₩ bbl. $2.38

Rosin—

Common and Good—Strained.

Rosin, C. & D.....₩ bbl.	$1.55	@$1.60
Rosin, E. & F.....₩ bbl.	1.60	@ 1.65
Rosin, G. & H ....₩ bbl.	1.70	@ 1.75
Rosin, I. & K.....₩ bbl.	1.95	@ 3.60
Rosin, M. & N.....₩ bbl.	3.00	@ 3.60

Shoes and Elbows—

See *Elbows and Shoes.*

Slate Roofing—

f. o. b. cars, Quarry Station.

	According to size.
Pennsylvania:	
Best Bangor, ₩ sqr.....	$3.25@$4.50
No. 1 Bangor Ribbon. ₩ sq	3.00@ 3.50
Pen Argyle, ₩ sqr.....	3.00@ 3.75
Peach Bottom, ₩ sqr.....	4.85@ 5.60
No. 1 Boys, ₩ sqr.....	3.35@ 3.55
No 1 Chapman Keystone, ₩ sqr	3.25@ 4.25
Vermont:	
Sea Green, ₩ sqr.....	$2.00@$3.15
Purple, ₩ sqr.....	3.75@ 4.25
Unfading Green, ₩ sqr...	3.25@ 4.50
Red, ₩ sqr	6.50@11.00
Maine:	
Brownville, Unfading Black:	
No. 1 quality.....	$5.25@7.50
No. 2 quality.....	$4.25@6.00

Solder—

½&½ guaranteed..... 16½@17¢
No. 1.....14@15½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	—Per Pound.— Barrels	Smaller Q'ntities
Concentrated Flux.....	4c	5c
Eureka Flux:		
Triple Strength...	3c	3½c
Extra Concentrated.....	4½c	5c
Crystal.....	..	7c
Gedney's Fluid.....	2c	2c
Lennox Fluid.....	2c	3c
Perfection Flux.....	3c	3½@4c
Yager's Salts, 1 lb. bottles.....	each, 50¢	
5 lb. bottles, per lb., 45¢		

Soldering Coppers—

Per lb.....17@18¢

Spelter—

Western Spelter.. .....4½@4¾¢

Spiral Pipe—

See *Conductors.*

Stove Pipe Elbows—

See *Elbows, Stove Pipe.*

Stove Trucks—

See *Trucks, Stove.*

Strainers, Conductor—

Galvanized..... .....50%

Tin Pigs and Bars—

Banca, pigs, ₩ lb..... .....24½@25 ¢
Straits, pigs, ₩ lb..... 24½@25 ¢
Straits, in bars, ₩ lb..... .....25½@26 ¢

Tin Plates, American Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:

IC,	14 x 20.....	$7.50
IX,	14 x 20.....	9.00
IXX,	14 x 20.....	10.25
IXXX,	14 x 20.....	11.50
IXXXX,	14 x 20.....	12.75

Melyn Grade:

IC,	14 x 20.....	7.00
IX,	14 x 20.....	8.50
IXX,	14 x 20.....	9.75
IXXX,	14 x 20.....	11.00
IXXXX	14 x 20.....	12.25

Allaway Grade:

IC,	14 x 20.....	6.50
IX,	14 x 20.....	7.60
IXX,	14 x 20.....	8.70
IXXX,	14 x 20.....	9.80
IXXXX,	14 x 20.....	10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight } IC, 14 x 20.....$5.00@5.25
" IX, 14 x 20.....$6.00@6.25

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates—

N. B.—The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance for 8 to 10 lb coating and $2.50 to $3 advance for 15 lb and upward.

About 40 lb coating..... $15.00@16.50
About 30 lb coating..... 15.25@15.75
About 20 lb coating..... 13.25@13.75
About 15 lb coating..... 11.25@11.75
About 8 lb coating..... .....@10.00

Boiler Plates, American—

IXX, 14 x 28..(112 sheets)..... $12.50
IXX, 14 x 28..(112 sheets)..... 13.50
IXX, 14 x 31..(112 sheets)..... 15.00

Troughs, Eave—

See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubes and Tubing—

Brazed Brass, List June 6, 1898 .....40%
Copper and Bronze, 3c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb. 6, 1899.
Tin.....50%
Galvanized.....50%
Fittings for do.....40%

Zinc—

600 lb casks ₩ lb.....6¾¢
Per lb.....7¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
30 gal.....70&10%
35 and 40 gal.....70%
Other sizes up to 52 gal....60@60&10%
52 gal. and above.....60%
Extra Heavy Boilers:
18 to 52 gal.....60%
53 gal. and above 55%

Brass Work, Plumbers'—

List of December 7, 1896.

Compression:
Basin Cocks.....60%
Bath Cocks and Double Bath Cocks.. 65%
Bibs. 65%
Bibs, Flanged.....65%
Fuller:
Bibs.....70%
Basin Cocks, Nos. 1 to 4.....70%
Bath Cocks, No. 4½.....$2.40 each net
Ground Key Work:
Finished Bibs.....55&5%
Rough Bibs and Stops.....70%
Rough Stop and Stop and Waste Cocks.....70@70&5%
Rough Stop and Stop and Waste Cocks, Patented.....65@65&5%

Miscellaneous—

Basin Clamps.....60@65%
Basin Plugs.....60@65%
Chain Stays.....60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face..₩ set	$0.05	$1.05
Ground Face ₩ set	$1.00	$1.10

Sink or Bath and Wash Tray Plugs.60@65%
Soldering Nipples.....70&5@75%
Soldering Unions.....70&5@75%
Union Elbows, Hot Water Heating.... 75@75&15%

Cocks, Valves, &c.—

Cocks—

Brass—

Air and Radiator Air .....75@75&5%
Gas Meter and Union Meter.....65@70%
Steam.....65@70%

Iron—

All Iron.....70@70&10%
Iron with Brass Plugs.....65@70%

Valves—

Brass—

Check.....65@70%
Garden Hose..... .....65&10@70%
Gate.....65@65&10%
Globe and Angle, hose outlet.65@65&10%
Globe, Angle and Cross...65&10@70&5%
Horizontal, Vertical and Angle Check... 65@65&10%
Hot Water Radiator 75%
Radiator.....70&10%
Safety.....65%
Safety, Low Pressure.....65%
Jenkins' Disc:
Check... .....65%
Gate.....65%
Globe, Angle and Cross.....70%
Radiator.....80%
Radiator, Corner.....75%
Safety.....65%

Iron—

Iron Body.....70@70&5%
Foot.....65@70%
Jenkins Bros.:
All Iron, except Gate.....40&5%
All Iron Gate.....35@40%
Iron Body, except Gate.....60%
Iron Body Gate.....50@50&5%
Swing Check..... .....50%

Earthenware—

Brown Glazed.....20%

Porcelain, List of Aug. 15, 1901: Class
Basins, Urinals and Hoppers.... A, 30%
Closet Bowls, Sundries, Washouts and Pedestals..... B, 40%
C, 50%

Fittings—

Brass Fittings—

Finished.....70@75%
Rough.....70@75%
Bushings.....70@75%
Nipples.....70@70&2½%
Unions, Rough and Finished....70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....65@70%
Cast Iron Bushings and Plugs....65@75%
Cast Iron Flanges.....65@70%
Cast Iron Floor Flanges.....65@75%
Malleable Iron Fittings.....70@75%
" " Bushings.....70@70&10%
" " Unions.....70&10@75%
" " Unions, Flange 60&10@70%
" " Pipe Hangers, Universal 50%
Wrought Iron Nipples.....70@75%
" " Couplings... .....60@65%
" " Long Screws.....60@65%

Lavatories—

Porcelain Enameled Iron.....30@30&10%

Oakum—

Plumbers' Oakum, 50 lb. bales, ₩ lb 2½¢

Pipe—

Brass, Iron Pipe Size—

⅛	¼	⅜	¾ to 3 Inch
$0.38	.34	.29	.23 ₩ lb

Cast Iron Soil—

List Feb. 25, 1901.
2 to 5 inch inclusive.

Standard.....60@60&10%
Extra Heavy..... ...65@70%
All Fittings.....70@75%

Wrought Iron—

List Feb. 15, 1900.

	Black.	Galv.
⅛ to ⅓ inch.....	57%	43%
¾ to 12 inch...	64%	51%

NOTE.—*Manufacturers' prices are much lower than above, but prompt shipments are not obtainable.*

Radiators—

Standard List.

Steam.....50&2½%
Hot Water..... .....50%

Sinks, Etc.— Cast Iron—

	Black.	Galv.
Sinks, Square, Half Round and Corner...	60@65%	60@65%
Sink Legs.	60%	60@65%
Sink Backs	60%	60@65%
Boiler Stands, Cast Iron.....	60@60&10%	
Cesspools, Cast Iron.....	60%	

Wrought Steel Sinks—

New Era, Galv'd and Enameled. ..70&5%
New Era, Painted.....50&10%
L. & G.....50%

Traps—

Drawn Lead Traps, List June 30, 1901...60%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns, Guaranteed, 45@50%
All Special Patterns..... .....25%
Non-Guaranteed Brands, complete line .....45@50%
Solid Copper, list of Feb. 1, 1899.....40%
Solid Porcelain—Class A, 30%; B, 40%; C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899.....45@50%

CLASSIFIED LIST OF ADVERTISERS.

Acetylene Gas Generators.
International Heater Co., Utica, N. Y.

Agate Nickel-Steel Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Aluminum Ingots.
Janney, Steinmetz & Co., Phila., Pa.

Aluminum Scrap Buyers.
Janney, Steinmetz & Co., Phila., Pa.

Aluminum Sheets.
Janney, Steinmetz & Co., Phila., Pa.

Architectural Ornaments.
Edwards Mfg. Co., Covington, Ky.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
Gerock Bros. Mfg. Co., St. Louis, Mo.
Mullins, W. H., Salem, O.

Ball Cocks
Foster, F. W. Mfg. Co., Boston, Mass.

Bathtubs.
Day Metallic Mfg. Co., Detroit, Mich.

Black Plates.
American Tin Plate Co., New York.
Taylor, N. & G. Co., Phila., Pa.

Boilers
Mueller, L. J. Furnace Co., Milwaukee, Wis.

Boilers, Range.
Koven, L. O. & Bro., 50 Cliff St., N. Y.

Brass Goods
Jenkins Bros., 71 John St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

CanMakers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

Castings, Iron.
Taylor & Boggis Foundry Co., Cleveland, O.

Caterpillar Destroyers.
Williamson, R. B., Clifton Springs, N. Y.

Ceilings, Metallic.
berger Mfg. Co., Canton, O.
Canton Steel Roofing Co., Canton, O.
Dowman Mfg. Co., Atlanta, Ga.
Eller, J. H. & Co., Canton, O.
Friedley & Voshardt, Chicago, Ill.
Gerock Bros. Mfg. Co., St. Louis, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Coal Vases.
Cincinnati Stamping Co., Cincinnati, Ohio.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
American Steel Roofing Co., Middletown, O.
Berger Bros. Co., Philadelphia, Pa.
Clark, Quieu & Morse, Peoria, Ill.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Dreis, Andrews & Krump, Chicago, Ill.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Machine & Tool Works, Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Cut Offs, Rain Water.
Cooney & Geiger, Indianapolis, Ind.

Dampers.
Howes, S. M. Co., Boston, Mass.
Stover Mfg. Co., Freeport, Ill.
Taylor & Boggis Fdry. Co., Cleveland, Ohio.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Curtis & Curtis Co., Bridgeport, Ct.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.
Toledo Mach. & Tool Co., Toledo, O.

Dryers.
Sommer's, John Son, Newark, N. J.

Dumb Waiters.
Energy Elevator Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Marlin & Co., Pittsburgh, Pa.
Reeves Mfg. Co., Canal Dover, O.

Eave Trough Hangers.
Berger Bros. Co., Phila., Pa.
Berger Mfg. Co., Canton, O.

Eave Trough Machines.
Marlin & Co., Pittsburgh, Pa.

Elbows, Stove Pipe.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Hanson & VanWinkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. Twenty-fifth St., New York.

Emery Wheels.
Scranton Corundum & Emery Wheel Co., Scranton, Pa.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Fire Pots.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Detroit, Mich.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement.
Rutland Fire Clay Co., Rutland, Vt.

Furnace Pipe and Fittings.
International Heater Co., Utica, N. Y.
Osborn, J. M. & L. A., Cleveland, O.

Furnaces and Heaters.
Amer. Furnace Co., St. Louis Mo.
Barstow Stove Co., Providence, R. I.
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bonnot Co., Canton, O.
Brand Stove Co., Milwaukee, Wis.
Brien Heater Co., Hoosick Falls, N. Y.
Cory, Uzal & Co. 210 Water St., N. Y.
Dighton Furnace Co., Taunton, Mass.
Floyd, Wells & Co., Royersford, Pa.
Graff Furnace Co., 208 Water Street, New York.
Hart & Crouse Co., Utica, N. Y.
Howes, S. M. Co., Boston, Mass.
International Heater Co., Utica, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Lennox Manufacturing Co., Marshalltown, Iowa.
Magee Furnace Co., Boston, Mass.
Mueller, L. J. Furnace Co., Milwaukee, Wis.
Peck Williamson Co., Cincinnati, O.
Richmond Stove Co., Norwich, Conn.
Schwab, R. J. & Sons Co., Milwaukee, Wis.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Ct.
Stanton Heater Co., Martins Ferry, O.
Tubular Heating and Ventilating Co., Phila., Pa.
Wireton Heating Co., Blue Island, Ill.

Gas Heaters. (*See Stoves and Ranges. Gas.*)

Gas Machines.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Granite Steel Ware.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Groovers.
Wheeler, W. A., Indianapolis, Ind.

Gutter Formers.
Double Truss Cornice Brake Co., Buffalo, N. Y.

Heat Regulators.
Æolipyle Co., 117 Beekman St., N. Y.
Howard Thermostat Co., Oswego, N. Y.
Wireton Heating Co., Blue Island, Ill.

Heaters, Steam and Hot Water.
American Radiator Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Dighton Furnace Co., Taunton, Mass.
Drake, W. H., Newark, N. J.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Gurney & Co., Boston, Mass.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
International Heater Co., Utica, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Magee Furnace Co., Boston, Mass.
National Pipe Bending Co., New Haven, Conn.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.
Richmond Stove Co., Norwich, Coun.
Sheppard, Isaac A. & Co., Phila., Pa.
Smith, H. B. Co., Westfield, Mass.
Smith & Anthony Co., Boston, Mass.
Smith & Thayer Co., Boston, Mass.
Stolz, Frank D., Chicago, Ill.
Vance Boiler Works Geneva N. Y.
Wireton Heating Co., Blue Island, Ill.

Hollow Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
National Enameling & Stamping Co., 78 Beekman St., N. Y.
Sperry, D. R. & Co., Batavia, Ill.

Hotel Cooking Apparatus.
Smith & Anthony Co., Boston, Mass.

Household Specialties.
Shepard, Sidney & Co., Buffalo, N. Y.

Ice Cream Dishers.
Seavey Mfg. Co., Boston, Mass.

Ice Cream Freezers.
White Mountain Freezer Co., Nashua, N. H.

Iron, Galvanized Sheet. (*See Sheets, Galvanized.*)

Iron and Steel, Sheet. (*See Sheets, Iron and Steel.*)

Iron, Planished Sheet.
Amer. Sheet Steel Co., New York.

Iron Shutters and Doors.
Garry Iron & Steel Co., Cleveland, O.

Lath, Metallic.
Schratwiesers Metal Lath Works.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lead Washers.
Littleford Bros., Cincinnati, O.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Lunch Boxes.
Seavey Mfg. Co., Boston, Mass.

Manufacturing Sites.
Chamber of Commerce, Muskegon, Mich.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Munsell, Eugene & Co., 218 Water St., New York.
Ohio Mica Co., Canton, Ohio.
Palermo Mica Co., 115 Beekman St., N. Y.
Rutland Fire Clay Co., Rutland, Vt.

Milk Cans.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Nickel Plating Outfits.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. Twenty-fifth St., New York.

Oil Heaters. (*See Stoves and Ranges, Oil, Vapor and Gasoline.*)

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.
Howes, S. M. Co., Boston, Mass
Monarch Stove & Mfg. Co., Mansfield, Ohio.

Patent Solicitors.
Hamlin, G. R., Washington, D. C.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Patterns.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Perforated Sheet Metal.
Harrington & King Perforating Co., Chicago, Ill.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pipe Cutting and Threading Machines.
Curtis & Curtis Co., Bridgeport, Ct.
Saunders, D. Sons, Yonkers, N. Y.

Pipe Joint Cement.
Callahan, Geo. & Co., 218 Front Street, N. Y.

Pipe, Lined.
Lamb & Ritchie, Cambridge, Mass.

Pipe Vises.
Walworth Mfg. Co., Boston, Mass.

Pipe, Water and Gas.
Millar, C. & Son Co., Utica, N. Y.

Pipe Wrenches.
Trimont Mfg. Co., Roxbury, Mass.

Plumbers Tools, Specialties and Supplies.
Anderson Coupling Co., Portland, Ct.
Barstow Stove Co., Providence, R. I.
Clayton & Lambert Mfg. Co., Detroit, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Foster, F. W. Mfg. Co., Boston, Mass.
Lamb & Ritchie, Cambridge, Mass.
National Pipe Bending Co., New Haven, Conn.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.
Walworth Mfg. Co., Boston, Mass.
Young, Jos. H., Boston, Mass.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Pliers, Pipe Expanding.
Anderson Coupling Co., Portland, Ct.

Pokers and Lifters.
Stover Mfg. Co., Freeport, Ill.
Troy Nickel Works, Troy, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St. Brooklyn, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Swaine, F. J. Co., St. Louis, Mo.

Pumps.
Lawless, John H., Jersey City, N. J.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Toledo Mach. & Tool Co., Toledo, O.

Radintor Shields.
Twin Burner Vapor Stove Co., St. Louis, Mo.

Radiators, Hot Air.
Burton, W. J. & Co., Detroit, Mich.
Independent Register Co., Cleveland, Ohio.

Radiators, Steam and Hot Water.
American Radiator Co., Chicago, Ill.
Gurney Heater Mfg. Co., Boston, Mass.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.

Range Boilers.
Koven, L. O. & Bro., 50 Cliff St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

Refrigerators.
Cooper & McKee, Brooklyn, N. Y.
Gurney Refrigerator Co., Fond du Lac, Wis
Wisconsin Refrigerator Co., Eau Claire, Wis.

Registers.
Canton Steel Roofing Co., Canton, O.
Dighton Furnace Co., Taunton, Mass.
Independent Register Co., Cleveland, Ohio.
Seavey Mfg. Co., Boston, Mass.

Roasters and Bakers.
Shepard, Sidney & Co., Buffalo, N. Y.

Roofing.
Asphalt Ready Roofing Co., 136 Water St., N. Y

Roofing Cement and Paint.
Callahan, Geo. & Co., 218 Front Street, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Rutland Fire Clay Co., Rutland, Vt.

Roofing Cork.
Stowell Mfg. Co., Jersey City, N. J.

Roofing Edger.
Danzer Metal Works, Hagerstown, Md.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
Berger Mfg. Co., Canton, O.
Burton, W. J. & Co., Detroit, Mich.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Reeves Mfg. Co., Canal Dover, O.

Roofing Nails.
Salem Nail Co., 379 Pearl St., N. Y.

Roofing Slate.
Bray, J. & Co., E. Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Genuine Bangor Slate Co., Easton, Pa.
Johnson, E. J. & Co., 38 Park Row, N. Y.
O'Halloran & Jacobs, Pittsburgh, Pa.

Sap Pails.
Shepard, Sidney & Co., Buffalo, N. Y.

Sap Spouts.
Millar, C. & Son Co., Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.

Screens.
Harrington & King Perforating Co., Chicago, Ill.

Sewer Pipe.
Rutland Fire Clay Co., Rutland, Vt.

Shears, Sheet Metal
McSherry, Chas., Pittsburgh, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y
Excelsior Tool & Mch. Works, St. Louis, Mo.
Keene Geo. C. & Co., Cincinnati, O.

SEE ALPHABETICAL INDEX, PAGE 58.

Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, F. J. Oo., St. Louis, Mo.

Sheets, Galvanized.
American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
McClure & Co., Pittsburgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Alan Co., Philadelphia, Pa.

Sheets, Iron and Steel.
American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Co., Alan Philadelphia, Pa.

Shingles and Tiles, Metallic.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Rooing Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.
Penn Metal Ceiling & Rfg. Co., Phila., Pa.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Siding. *(See Roofing and Siding.)*

Sinks.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.

Skylights.
Canton Steel Roofing Co., Canton, O.
Drouve, G. Co., Bridgeport, Conn.
Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 279 Pearl St., N. Y.

Smoke Test Machine.
Gunster & Forsyth, Scranton, Pa.

Snow Guards.
Clason Arch. Metal Works, Providence, R. I.

Solder.
Bruce & Cook, 186 to 190 Water St., N Y
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Burgess Soldering Furnace Co., Columbus, Ohio.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties, Sheet Metal.
Vogel, Wm. & Bros., Brooklyn, N. Y.

Steam and Gas Fitters' Supplies.
Curtis & Curtis Co., Bridgeport, Conn.
Walworth Mfg. Co., Boston, Mass.

Steam and Water Engineering and Regulating Specialties.
Kieley & Mueller, 7-11 West 13th St., N. Y.

Steel Shapes.
Cambridge Rolling Mill Co., Cambridge, Ohio.

Steel Stamps and Stencil Dies.
Schwerdtle Stamp Co., Bridgeport, Ct.

Stove Cement.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Rutland Fire Clay Co., Rutland, Vt.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.
Hoffman, Geo. W., Indianapolis, Ind.
Rutland Fire Clay Co., Rutland, Vt.

Stove Patterns.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Milwaukee Pattern Works, Milwaukee, Wis.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
City Forge & Iron Works, Dayton, O.
O. K. Mfg. Co, Buffalo, N. Y.

Stove Repairs.
Clark, Henry N. Co., Boston, Mass.
Howes, S. M. Co., Boston, Mass.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
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Troy Nickel Works, Troy, N. Y.

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Troy Nickel Works, Troy, N. Y.

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Smith & Anthony Co., Boston, Mass.
Stamford Foundry Co., Stamford, Ct.
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Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
Adler H. & Co., Pittsburgh, Pa.
Detroit Stove Works, Detroit, Mich.
Dighton Furnace Co., Taunton, Mass.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.
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National Vapor Stove & Mfg. Co. Lorain, O.
Ringen Stove Co., St. Louis, Mo.
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Osborn, J. M. & L. A., Cleveland, Ohio.
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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Official letters of reference should not be inclosed with replies to advertisements appearing in these columns as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

At once, a good PLUMBER and STEAM FITTER; steady job to a good man. Charles Thomas, Kennett Square, Pa. Jan. 25

An all around TINNER; steady work and good wages to the right man. Herman Soehner, Dayton, Ohio. Jan. 25

A good PLUMBER and TINNER, at once; state wages expected; steady work to good man. Jos. Netzer, Laredo, Texas. Jan. 25

CORNICE MAKER, competent to cut out work, make drawings and estimates; also competent galvanized iron stock tank maker; give reference. Gedge Bros. Iron Roofing Co., Anderson, Ind. Jan. 25

A first-class STOVE PATTERN FITTER; steady employment. "Iron Patterns," care *The Metal Worker,* New York. Jan. 25

A first-class TINSMITH and PLUMBER wanted at once for a country shop; steady job to right man. E. H. Mason, Shingle House, Pa. Jan. 25

TINNER and SLATER at once; must be good workman; steady work. P. H. Bayley, Sidney, Ohio. Jan. 25

SALESMEN, tinners of some experience preferred, to introduce Williams' patent adjustable stove pipe fastener. Lawrence Stamping Works, North Lawrence, N. Y. Jan. 25

A first-class PLUMBER, STEAM and HOT WATER HEATER, also some knowledge of tinning; state wages desired per day. Box 30, Lewisburg, Pa. Jan. 25

A first-class PRESSMAN, one that understands the stamping thoroughly and a good spinner; Germans preferred; can start at once. "M. E.," care *The Metal Worker,* New York. Jan. 25

An experienced SALESMAN visiting the hardware and stove trade for New York and the New England States, to sell a standard line of high grade air tight heaters for wood, as a side line, on commission; only first-class men with experience in this territory need apply; state territory covered. Box 88, Quincy, Ill. Jan. 25

Thoroughly competent FOREMAN for sheet metal shop doing all classes of work, also furnace work; one who can cut his own patterns, lay out the work and handle men to advantage; state experience and wages wanted. "J. B.," care *The Metal Worker,* New York. Jan. 25

A competent FOREMAN on gas machines. The Mitchell Roofing Company, Incorporated, 511 Eleventh street, N. W., Washington, D. C. Jan. 25

TRAVELING SALESMAN, acquainted with roofing, sheet metal, roofers' and tinners' supplies, cornices and steel ceiling preferred, having personal acquaintance with Michigan trade; best references required. "X. Y. Z.," care *The Metal Worker,* New York. Jan. 25

A man to do PLUMBING and TINNING; must be able to estimate on plumbing work. R. A. Zoeller, Tarboro, N. C. Jan. 18

Experienced FOREMAN of good mechanical ability for a nested stove pipe factory. "Manufacturer," care *The Metal Worker,* New York. Jan. 18

First-class PATTERN MAKER who understands molding and is competent to make mechanical drawings for house heating steam and hot water boilers, and to design a new boiler to put on the market. M. N. Hedges, Chattanooga, Tenn. Jan. 18

At once, two TINNERS who can also do slate roofing; none but first-class men wanted; nine hours; $2.50 per day. Smith & Manrow, Washington, Pa. Jan. 18

Young man as ASSISTANT FOREMAN in cornice shop; must have at least three years' experience, strictly temperate and a hustler; to such a man we will give yearly contract; good chance for advancement. Johnson Mfg. Company, Greensboro, N. C. Jan. 18

Good penman with knowledge of bookkeeping, to make himself generally useful around country plumbing shop; must be obliging and industrious; state wages desired; permanent job to right party; location, New Jersey, near New York. "Heating," care *The Metal Worker,* New York. Jan. 18

Several good CORNICE MAKERS for in and outside work; steady work for the right men. Johnson Mfg. Company, Greensboro, N. C. Jan. 18

A good all around man for village shop; single man preferred; temperate and industrious. Henry Ballard, Patterson, N. Y. Jan. 18

Two thoroughly competent TINNERS and CORNICE MAKERS; some knowledge of slating preferred; will expect parties taking position to remain for the year; wages from $2.50 to $3 per day. "Tinner," 35 West Wheeling street, Washington, Pa. Jan. 18

JOBBING PLUMBER who is a respectable man of good appearance, with a knowledge of first-class country work, who can close up houses in fall and open them in spring; must be a plumber with some knowledge of heating, engines, pumps, rams, &c.; state wages for permanent job. "Good Job," care *The Metal Worker,* New York. Jan. 18

A thoroughly competent man for SUPERINTENDENT of a steel and gas range plant; must have had experience and come well recommended. "Range," care *The Metal Worker,* Hamilton Building, Pittsburgh, Pa. Jan. 18

A good TINNER and SLATER; one that understands putting up cornice work; by March 1; steady work and good wages; married man preferred, and reference required. Lentz & Norr, Piqua, Ohio. Jan. 18

Three good TINSMITHS who can do inside and outside work, such as cornice, skylight, general jobbing, roofing and whatever belongs to the tinsmiths' trade; steady work for such men; $3 a day. Osmar Poeschel, 610 Spring street, West Hoboken, N. J. Jan. 18

SITUATIONS WANTED.

By a first-class PLUMBER; temperate and best of reference furnished. P. Kelly, 194 Concord street, Brooklyn, N. Y. Jan. 25

As FOREMAN of foundry, stove or jobbing; mixing and melting of iron thoroughly; 15 years' experience on stoves and ranges; also gas and oil stoves; five years on jobbing; core work understood; can produce A1 castings; understand handling of men to best advantage; good references; speak German and English. "Franklin," care *The Metal Worker,* New York. Jan. 25

By a good, experienced TIN and METAL WORKER; in or outside work. M. Jaffe, care A. Lazer, 23 Allen street, New York. Jan. 25

TIN and SHEET IRON WORKER, any kind, piece or day, or general jobbing shop. "Smith," 51 Third avenue, New York. Jan. 25

By TINSMITH and SHEET IRON WORKER; can do anything in the line of roofing, range, heater and furnace work; also good jobber at plumbing, steam and gas fitting; age 32; would like steady place. E. Burger, 1376 Third avenue, New York. Jan. 25

As PLUMBER and GAS FITTER; by young man (single), nine years' practical experience, also some knowledge of steam and hot water fitting; references. John J. McMullen, 188 Straight street, Paterson, N. J. Jan. 25

As CUTTER and FOREMAN in cornice and sheet metal works in the vicinity of New York, by first-class cornice maker; can estimate, also handle help to advantage; would like to change about March 1. "John," care *The Metal Worker,* New York. Jan. 25

First-class PLUMBER and GAS FITTER wants work; city or country. J. O'Hare, 459 West Thirty-fifth street, New York. Jan. 25

A first-class PLUMBER, GAS and STEAM FITTER wishes steady employment; strictly temperate; can figure from plans and take charge of work; 15 years' experience; married man. Address "D. C.," 2913 Washington avenue, St. Louis, Mo. Jan. 25

By first-class TINNER; understand plumbing, furnace work and have had experience in the hardware and furniture business as clerk and speak four languages; open for position about April 1; 26 years old. Lawrence Marchetti, Weston, Pa. Jan. 25

As PLUMBER; six years' experience; references; can go any place. "J. B. W.," care *The Metal Worker,* New York. Jan. 25

First-class, all around PLUMBER, also acquainted with the relative lines, wishes steady position; A1 references. James Neary, 152 East Forty-first street, New York. Jan. 25

By a first-class PLUMBER and GAS FITTER; also some knowledge of steam fitting; best of references if needed. L. Buckley, 20 Welder street, Rochester, N. Y. Jan. 25

Experienced PLUMBER with A1 references; city or country. "Plumber," care McCarthy, 114 East Fifty-third street, New York. Jan. 25

As TRAVELING SALESMAN; six years' experience in selling hardware and stoves in Ohio, Indiana and Michigan; desire to connect with a first-class house; A1 references. "Salesman," care *The Metal Worker,* New York. Jan. 25

By FOUNDRY SUPERINTENDENT with 16 years' experience in the manufacture of stoves, ranges and steam boilers; have a thorough knowledge of the business from the cupola to the finished article; understand the most modern cupola practice and can handle help to advantage; references as to character and ability from past and present employers. "Superintendent," care *The Metal Worker,* New York. Jan. 25

Experienced CONSTRUCTION HEATING ENGINEER wishes a steady position; thoroughly competent upon the various systems of heating and power work; can estimate, lay out; up to date; knowledge of fire sprinkler work; able to take full charge of fitting department in a first-class firm; references; steady. "Steam," 123 West Forty-sixth street, New York. Jan. 25

By young man who has had three years' experience in the metal business; will accept anything; at present employed. "R. S.," care *The Metal Worker,* New York. Jan. 25

By an industrious young man, a position as SHIPPER or TRAVELING SALESMAN; has had six years' experience with an old Philadelphia foundry; understands stove and range business thoroughly. "D. E. A.," 1618 South Sixth street, Philadelphia, Pa. Jan. 25

Two young men would like positions with some good, reliable, out of town house; one as a first-class TIN ROOFER and FURNACE WORKER, the other as a SALESMAN or HANDY MAN; first-class reference from former employers will be sent on writing for them. "J. S.," 47 Milford street, Brooklyn, N. Y. Jan. 25

As JAPANNER; by a middle-aged man of 25 years' experience who thoroughly understands his business; also good color mixer, stencil cutter, &c.; had charge as foreman in one of the largest trust factories for the past 16 years; can handle help to good advantage; piece work or otherwise. A. C. Wilroy, care Smith & Cronin Mfg. Co., 290 Pearl street, New York. Jan. 25

Steady position as FOREMAN in a first-class country shop employing 20 men or less, within 50 miles of New York City, by a first-class tinsmith and sheet iron worker; have had 15 years' experience in country shop, three years in city, two years as foreman; can do all kinds of work that comes to such a shop, including furnace, ventilating, &c.; strictly temperate and steady; best of references. F. H. Potter, 1364 Brook avenue, New York City. Jan. 25

Young man, 20 years old, with some good, reliable, out of town house, where he can work himself up; can furnish best of references from former employers; only parties that will guarantee steady work need answer. F. McKenna, 48 Montauk avenue, Brooklyn, N. Y. Jan. 25

By a TINSMITH with 15 years' experience on all lines of inside and outside work; furnace work, gas and water fitting and slating. Fred Roberts, Linesville, Pa. Jan. 25

By a good in or outside CORNICE MAKER; expert on drafting; a good raiser; 22 years' experience; age 36 years; New York, New Jersey or Brooklyn preferred. Adolf Klein, 403 East Eleventh street, New York. Jan. 25

By an EXPERT OPERATOR on steam power cornice brake; first-class references; at present unemployed but desirous of making a change. "Operator," care *The Metal Worker,* New York. Jan. 25

A steady and reliable TINSMITH is open for permanent engagement; 15 years' experience in country shop; can clerk in store; first-class references or bonds if necessary; absolutely trustworthy; country preferred. "Honest," care *The Metal Worker,* New York. Jan. 25

By a sober, industrious man of over 20 years' experience as PLUMBER, STEAM and HOT WATER FITTER; can figure and lay out work, make plans, &c., and has for the past few years been foreman of a shop; would invest some money to get into an agreeable position. "Plumber," 249 Highland avenue, Somerville, Mass. Jan. 25

By a young man, aged 33 years; has had ten years at general jobbing in tinning, stoves, pump and iron pipe work; is single, steady, sober, willing and obliging; wages, $7 per week and board. Jos. Brooks, Lockington, Ohio. Jan. 25

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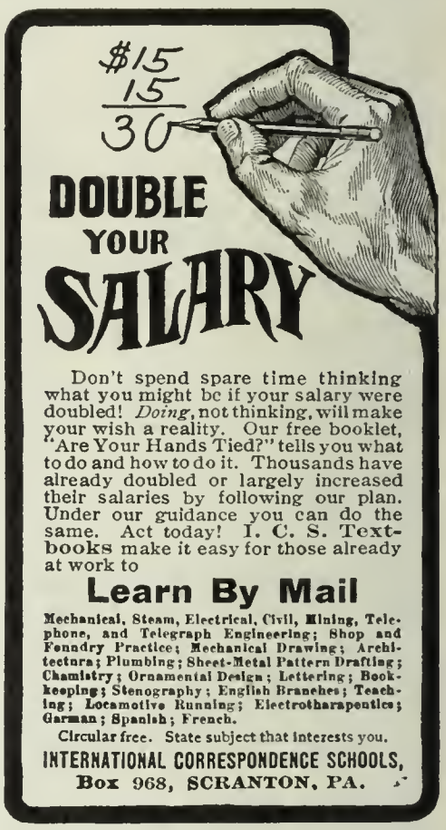
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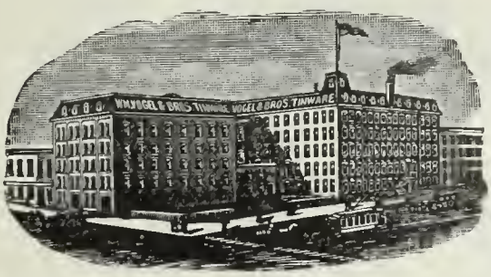
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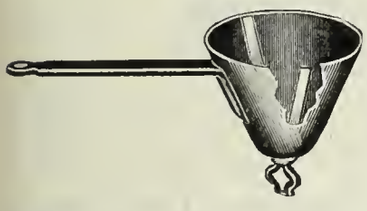
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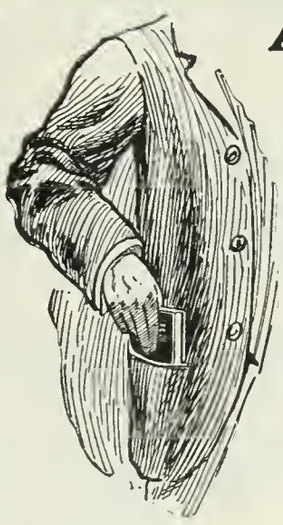
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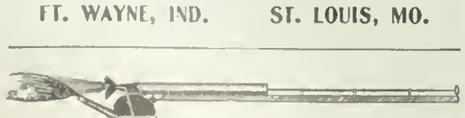
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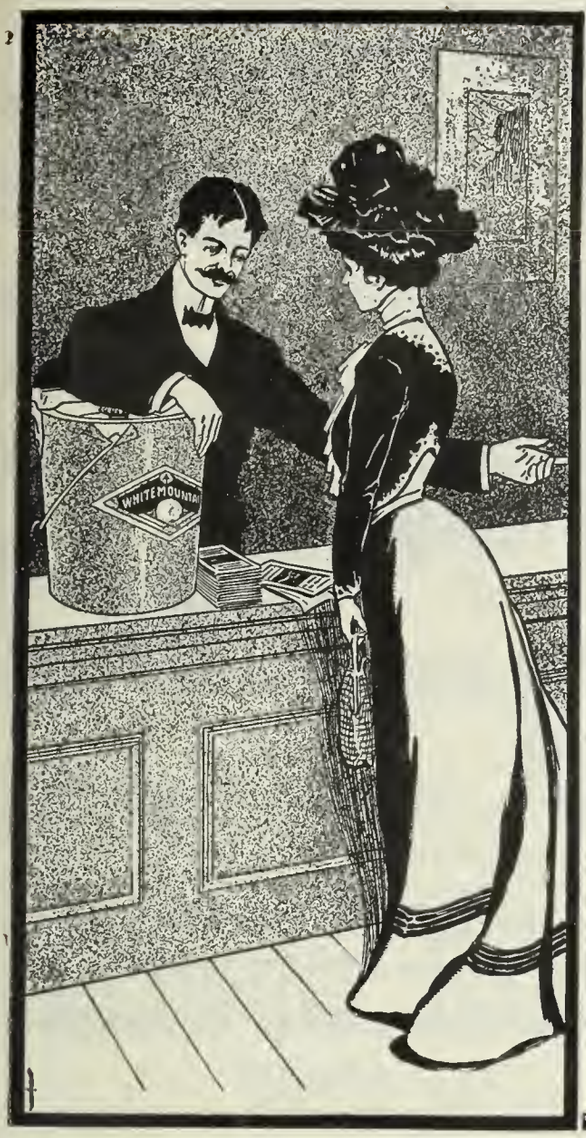
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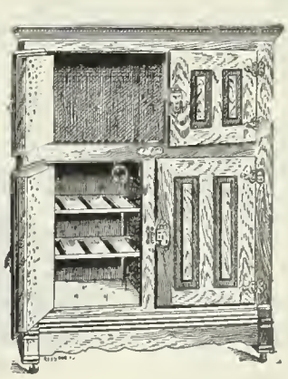
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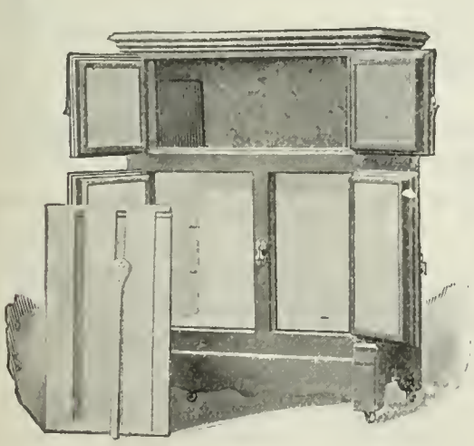
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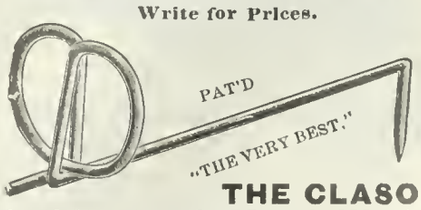
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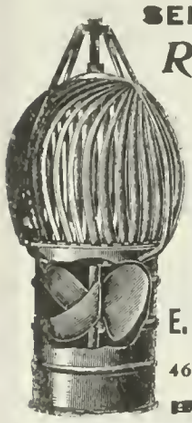
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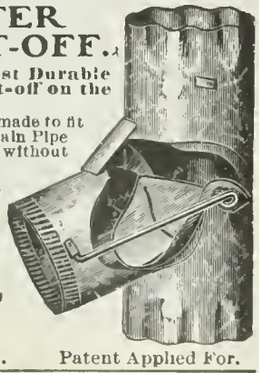
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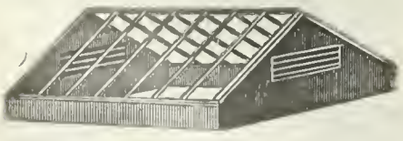


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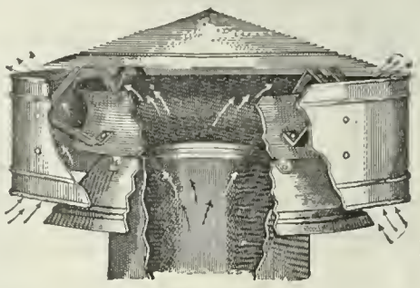


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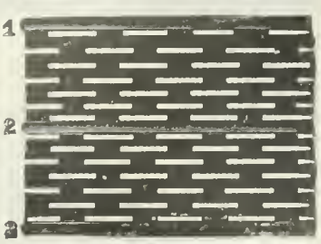
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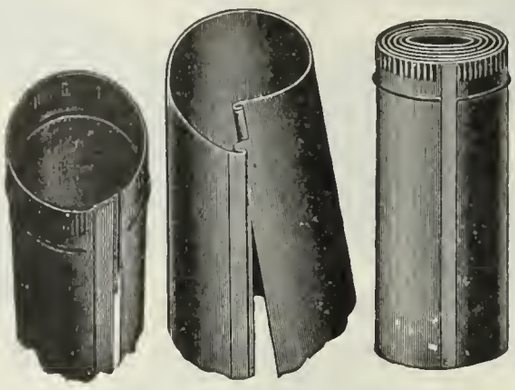
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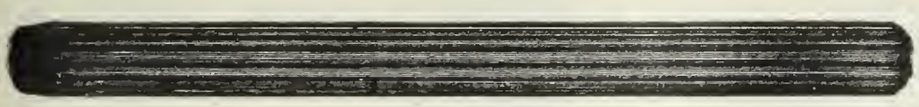
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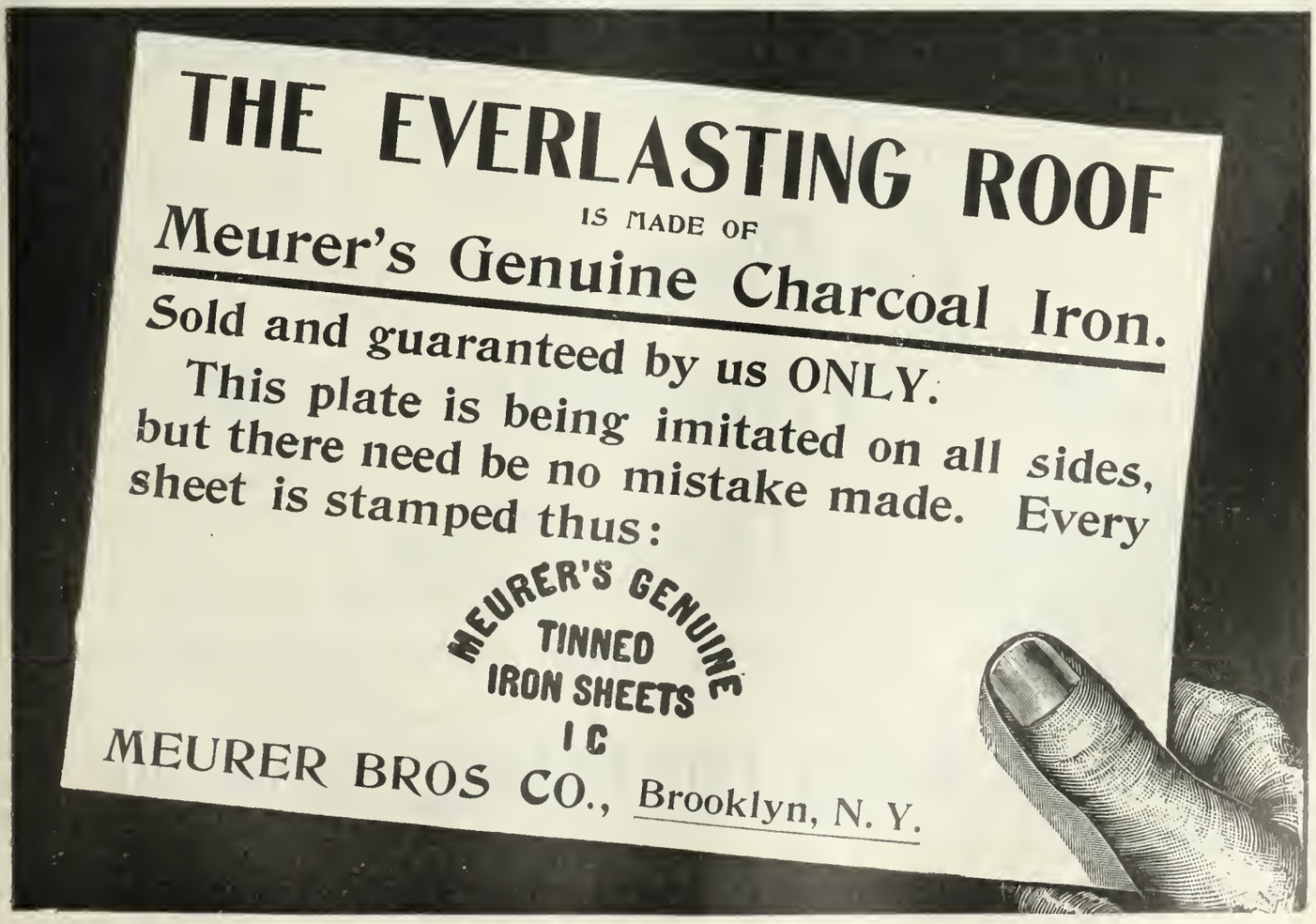
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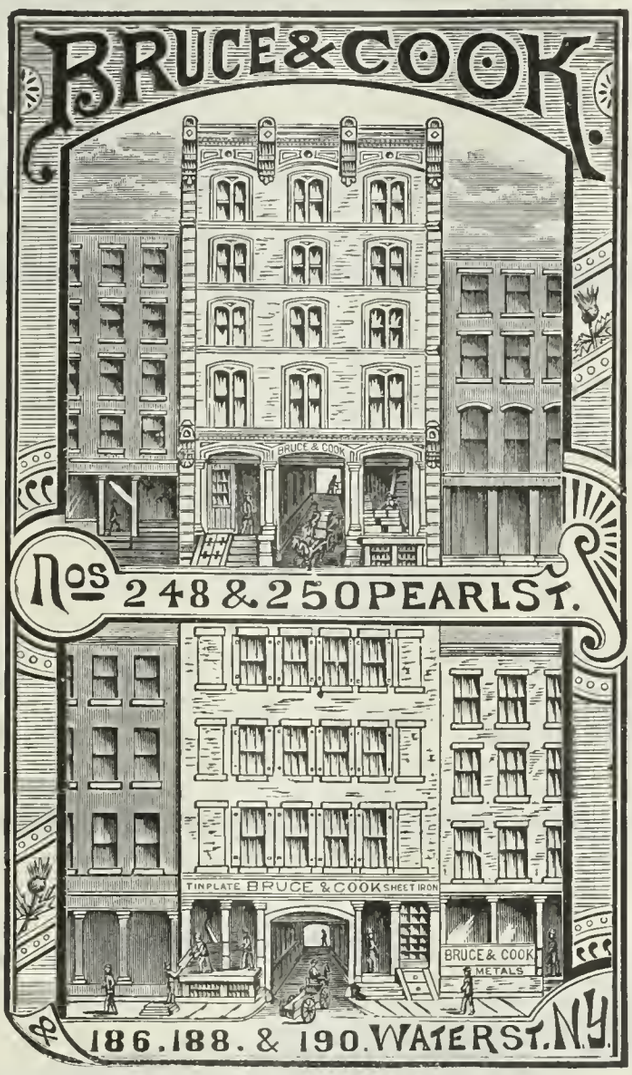
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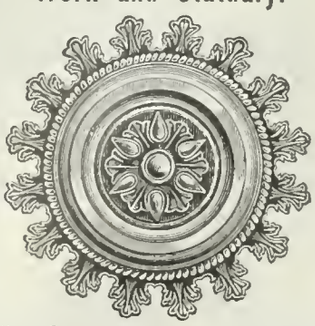


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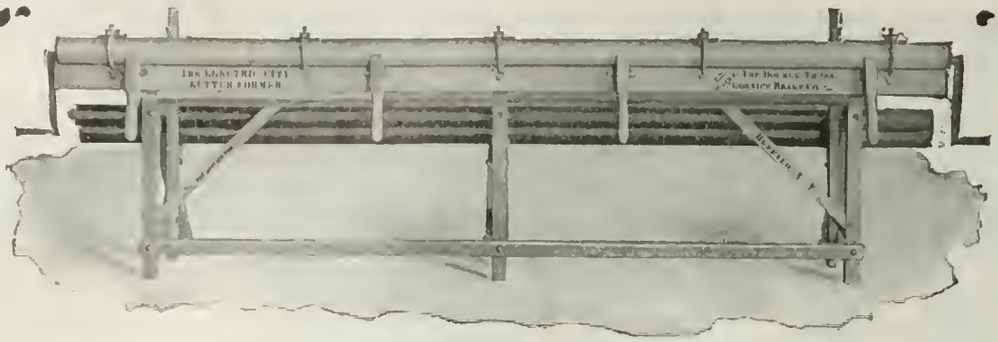
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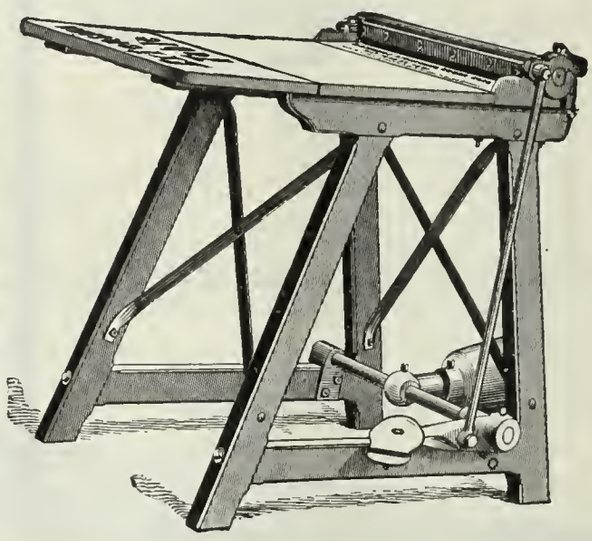
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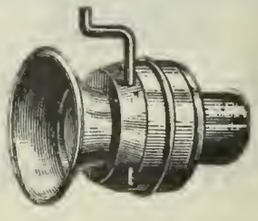
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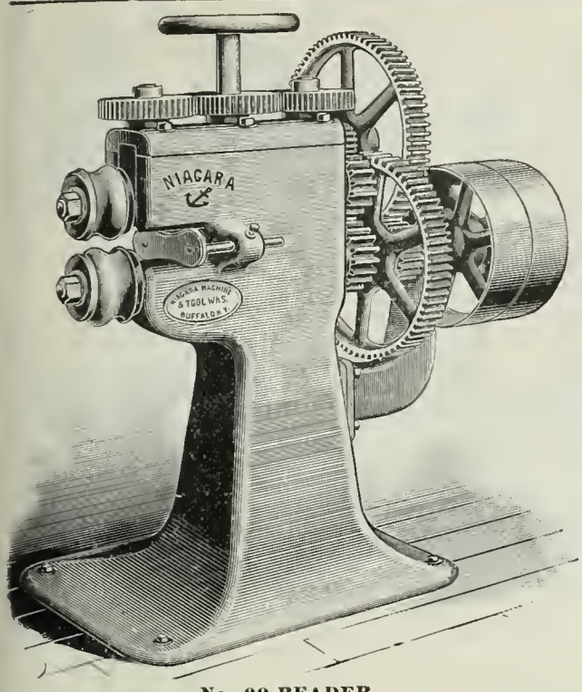


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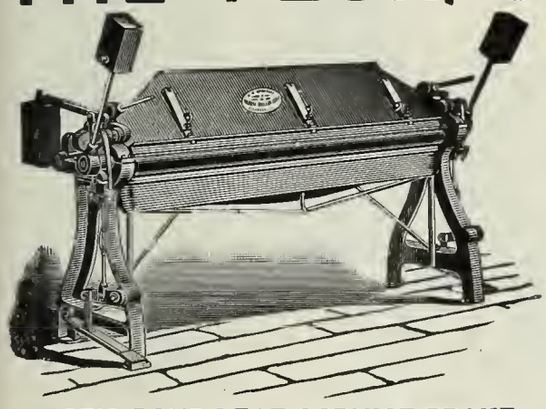
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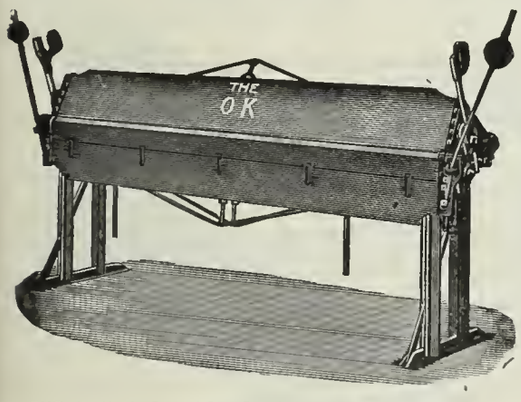
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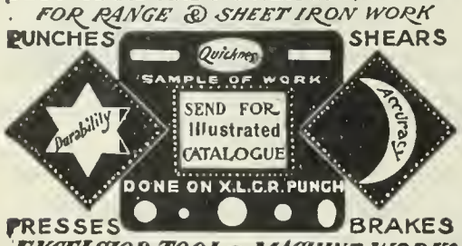
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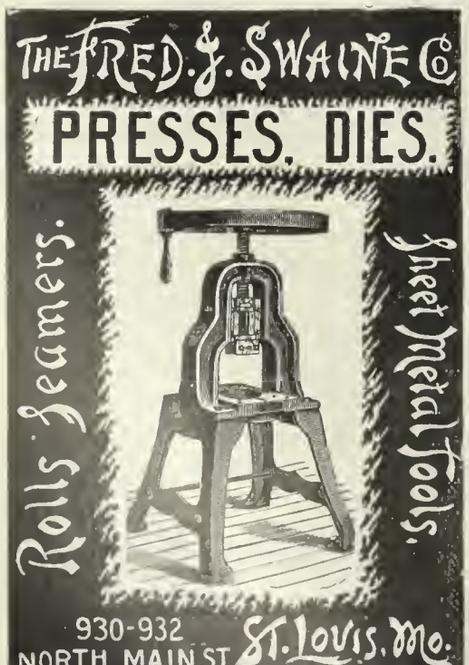
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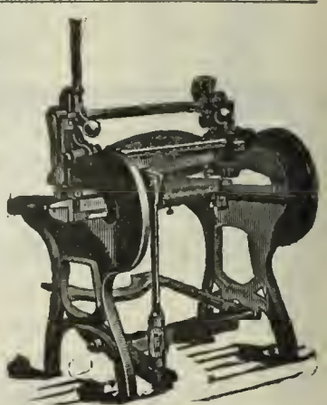


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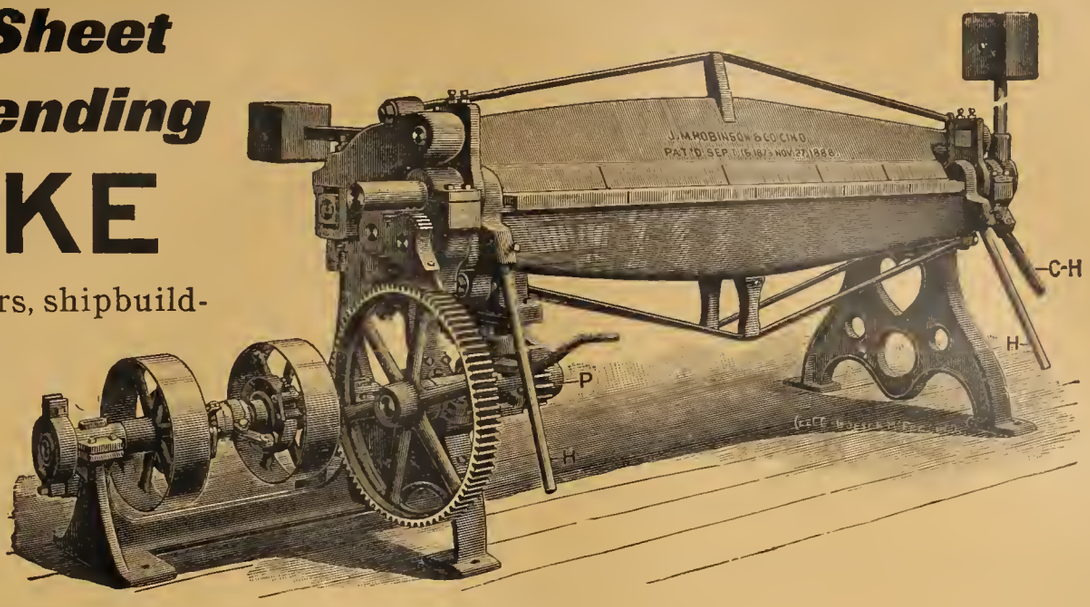
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For range makers, shipbuilders, navy yards, and wherever heavy sheets are to be worked or formed. Made in 6 and 8 foot lengths, to bend No. 10 gauge or lighter.

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make the cutting of sheet metal of heavy gauges an easy task for the mechanic and a profitable operation for the employer. With them a man can cut No. 12 steel with one hand on the lever, leaving the other hand free to guide the stock while cutting elbows, ties and circles, as small as 8 inch radius; this is done without burning or buckling either piece, thus avoiding hammering and straightening, which add to the cost of the product. They split sheets of any width or length up to No. 12 gauge, cut wire or bar-steel ½ inch thick, cut off and mitre angle iron ⅛ inch thick, and do it perfectly.

PRICE, - - $35.00.

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TINNERS' TOOLS, MACHINES, and SUPPLIES. Plumbers' Tools, Tinners' Hdwe., Soldering Flux, Salts, Coppers, Rosin, Roofing Cement, Rivets, Bolts, Screws, Slaters' Tools, Second-hand Machinery and **SKYLIGHT GEARING.**

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— BOTH INDIGNANT. — "See here!" cried the irate politician, "you called me a trickster and a jobber in your paper."

"Yes," replied the editor, "I discovered that misprint just this moment. I have sent for the guilty compositor to come here and explain."

"Oh, come off. You can't shift the blame on him."

"What! Why, you idiot, don't you suppose I know what I wrote? I made it 'a trickster and a robber,' and I wrote it plain."—*Exchange.*

— A SCOTCH divine took one of his parishioners to task for his nonattendance at kirk; the man said: "I dinna like lang sermons." The parson, with some wrath, replied: "John, ye'll dee, and go to a place where ye'll not have the privilege of hearing long or short sermons." "That may be," said John, "but it winna be for lack of parsons." —*Exchange.*

— HUNGRY HOOLEY: "How d'yer feel, old chappie?"

Empty Egan: "Like a meal ticket wit' every meal punched out."—*Brooklyn Life.*

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By the forelock and secure the agency for the **New Model Grand** before your competitor gets it. It is as great a bread **winner** as it is a bread baker.

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and other institutional buildings having long corridors, large wards, dormitories and dining rooms can be lighted most satisfactorily and economically by using **Frink's Cluster Reflectors.**

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Dunbar Foundry Pig Iron.
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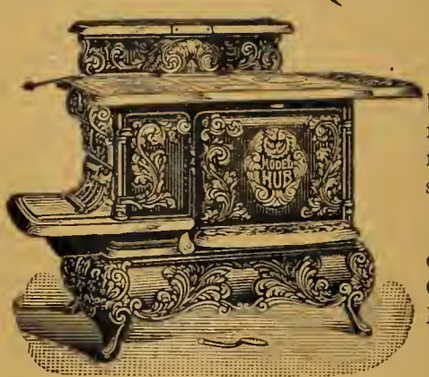


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Are made open or closed, and a full line of other Maple Sugar goods. Send for dealers' price list.

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HUB RANGES sell quickl because they contain many exclusive sellin features, so sensible an self evident.

HUB RANGES are used an endorsed by all the leadin Cooking Schools in Ne England and New York.

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In Stove Times

the far-sighted stove merchant builds a reputation, by mak ing popular in his home town, ONE thoroughly reliable stov line. ONE that will be to him, because of its association, constant source of profit in future years. That ONE should b

GLENWOOD

Write the Weir Stove Co., Taunton, Mass.

FINE BRANDS OF
BRIGHT CHARCOAL FINISH
TIN PLATES.

"Brilliant,"
Tissue Paper Packed.

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A FULL LINE OF COKE FINISHED PLATES.

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We Solicit Your Inquiries for
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A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

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A first-class Tool for General Machine Work. Takes to 6-inch.

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The Gorton Side Feed Boilers

FOR STEAM AND HOT WATER HEATING.

INVESTIGATE FOR YOURSELF.

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it is the life blood
of business, but
the best advertising
becomes palsied
unless backed up
by good goods.
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to put good ads
in the newspapers
and bad ranges
in the kitchens.
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and the ad
should work together.
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Round Oak
it will corroborate
all the strong statements
you can put
in black type.
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the range business
in your territory
this spring?
Take up the
Round Oak
and go after it
hot foot.
It pays to advertise
and push the sale
of a good specialty.
Think it over.

"Go After It Hot Foot"



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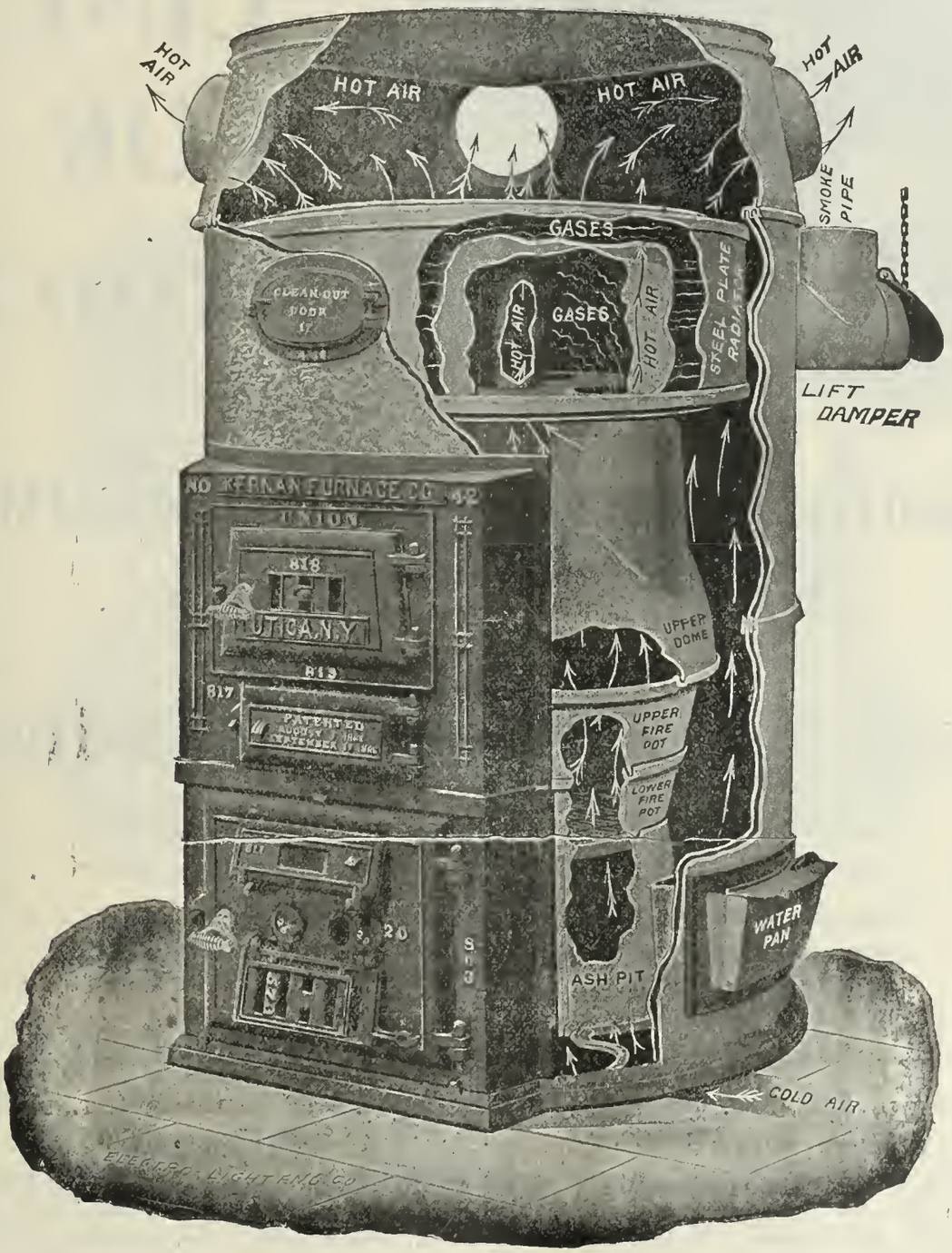
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The KERNAN UNION

WARM AIR FURNACE.



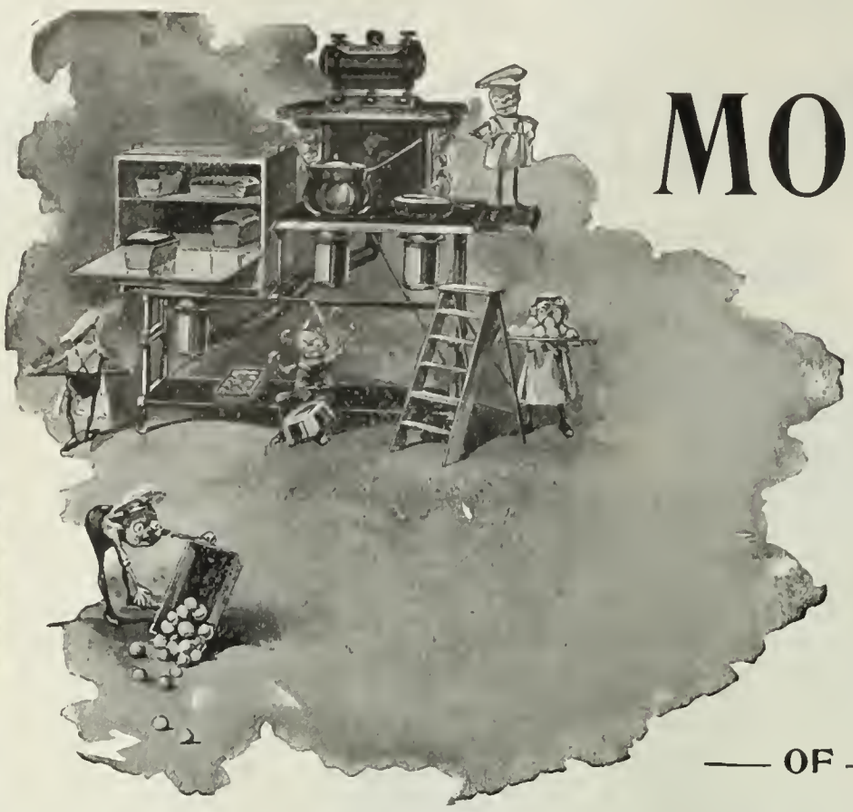
A highly scientific apparatus with very many strong "Talking Points."
It is easily operated and very durable.
When it's sold, it stays sold. No "Back Talk."

A Thoroughly Good Furnace at a Moderate Price.

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Gasoline Stoves, Wickless Blue Flame Oil Stoves

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Famous Monarch Asbestos-Lined Ovens

Are without question the most modern and up-to-date line ever offered. The dealer handling this line is sure to hold his trade "Monarchs," unlike others, "never come back,"—once sold, stay sold, because they're made on honor. . . .

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67 LAKE ST., CHICAGO. 191 EAGLE ST., ST. PAUL, MINN.

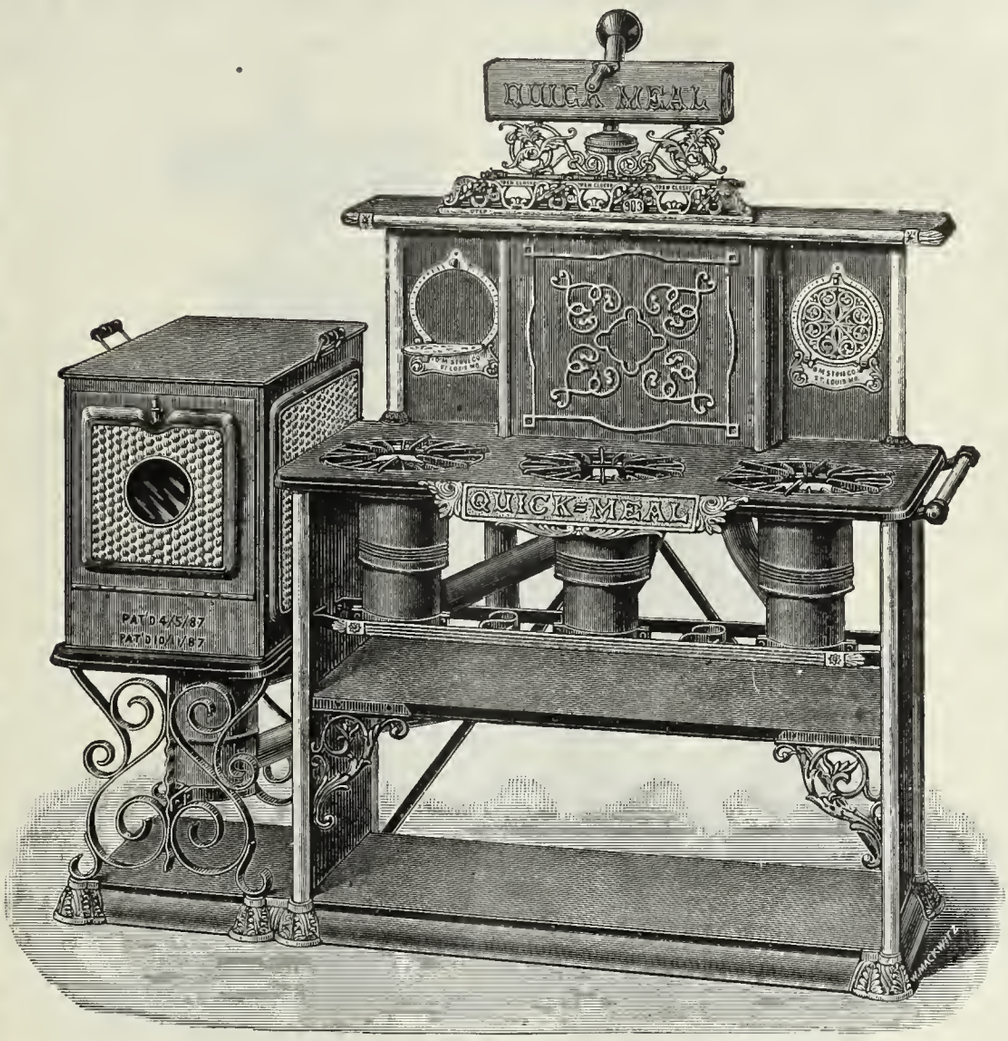
H. R. Bruce & Co., Cincinnati, Ohio. Central Supply Co., Des Moines, Iowa. Newby Stove Repair Co., Kansas City, Mo. Bartlett and Norris, Lincoln, Neb. W. H. Gruenhagen, St. Paul, Minn. M. F. Stellwagen, in Wisconsin. Kellogg & Stokes Stove Co., Denver, Colo. R. P. Smith, Houston, Texas.

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Why **The "Quick Meal Evaporating Vapor Stoves" have been such a pronounced success?**

Because Their burner drums have always been made of the **heaviest** and **most durable materials known.** The **"Quick Meal"** has always used the only successful sub-burner, and has the most successfully arranged evaporating tubes for circulating and mixing the gas and air. They are simple, strong and durable. The assortment of the **"Quick Meal Evaporating" Stoves** is the largest on the market. Their styles are the latest and their finish the finest.

"Quick Meal" Steel Ranges are sold by enterprising dealers everywhere.

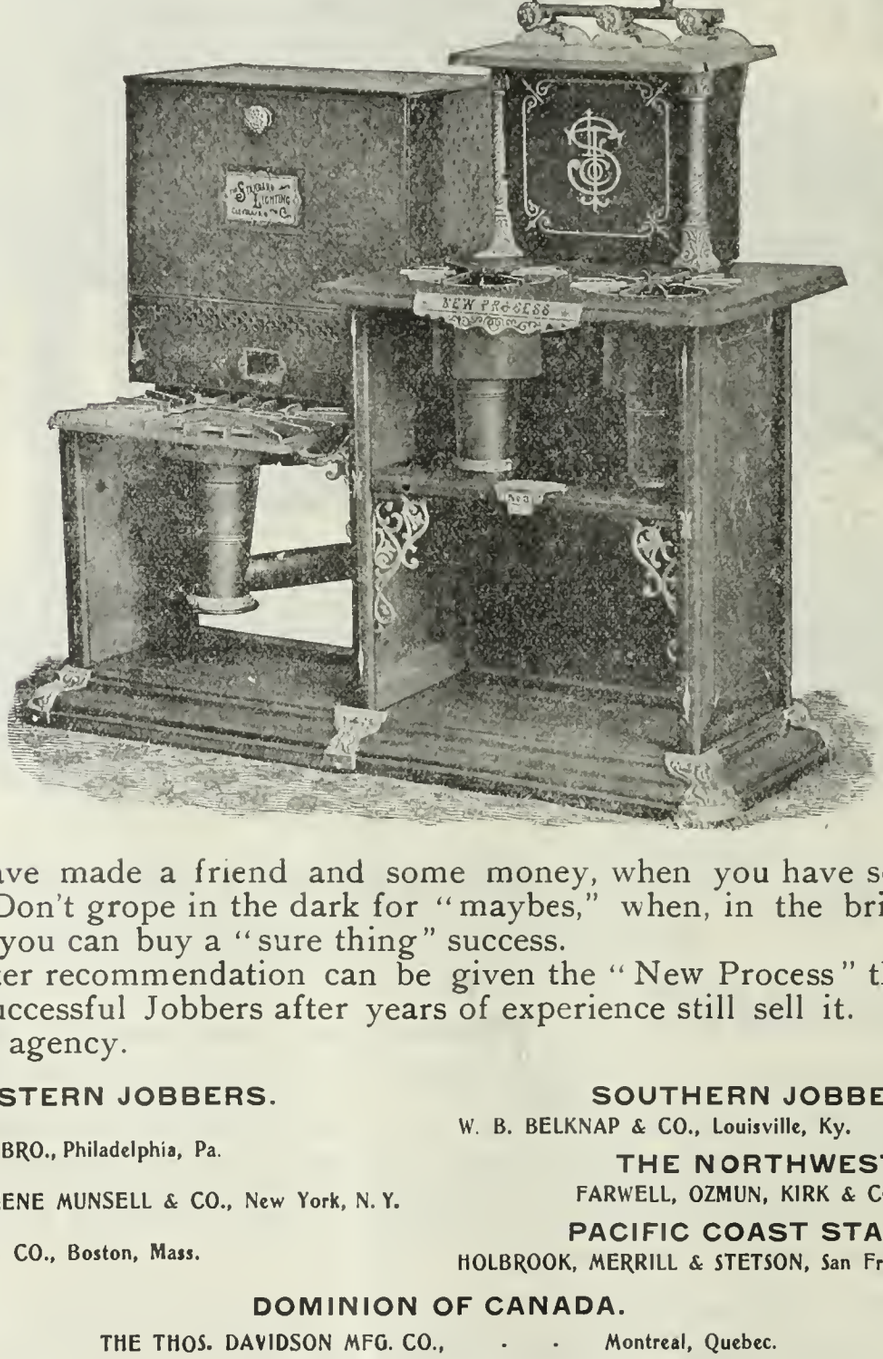
RINGEN STOVE Co. SAINT LOUIS

Old as the Oldest, New as the Newest.

If You Are Not, You Ought to be Selling

The "NEW PROCESS" VAPOR STOVE

The Most Popular and Successful Gasoline Stove Ever Made.



You have made a friend and some money, when you have sold a "New Process." Don't grope in the dark for "maybes," when, in the bright light of experience, you can buy a "sure thing" success.

No better recommendation can be given the "New Process" than that the following successful Jobbers after years of experience still sell it. Write them now for the agency.

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Reliable Vapor Stoves and Ranges for 1902.

DEALERS who are seeking a strictly high grade line of Vapor Stoves and Ranges that are standard the country over cannot afford to overlook our line. "**RELIABLE**" Stoves have the NAME and FAME as being the best and most successful to handle.



THERE are NONE better. A few are claimed as good. None as well and favorably known. Our reputation will not permit of our making any inferior goods. If you wish to control the Vapor Stove business of your city, secure the agency of the "**RELIABLE.**" They have proved profitable and satisfactory to thousands in the past, and will to you.

Our line for 1902 is larger and finer than ever. Send for our latest catalogue. It is yours for the asking.

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The Schneider & Trenkamp Company,

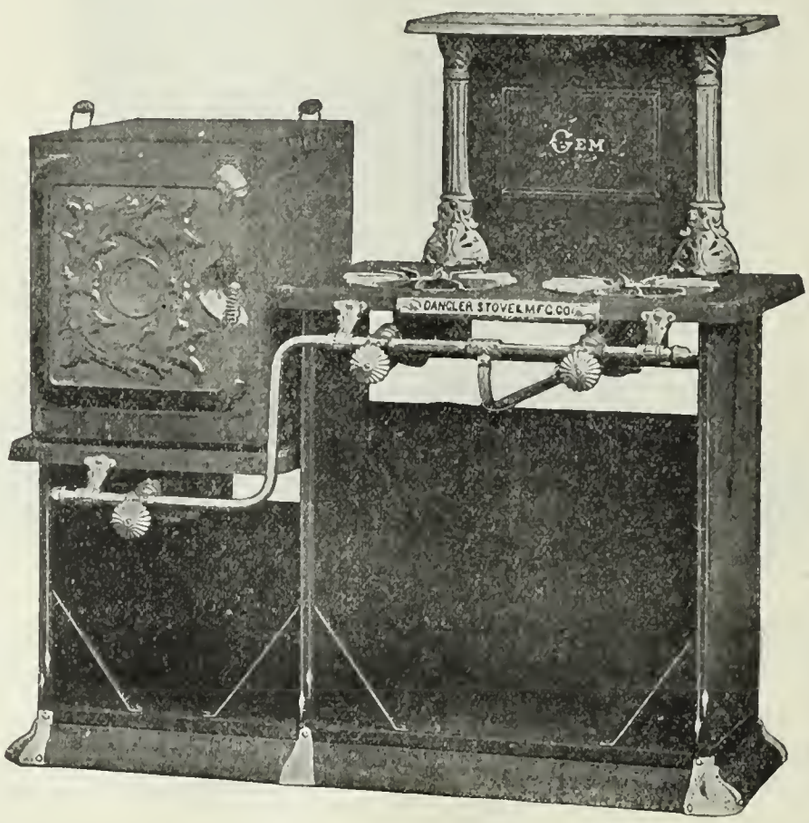
CLEVELAND. CHICAGO. SAN FRANCISCO.

THE DANGLER

For 1902 will put on the market a line of

Gasoline Vapor and Evaporating Stoves, Blue Flame Wick and Wickless Oil Stoves and also a line of Gas Ranges, Stoves, Hot Plates, etc. . . . . .

That for design, style and mechanical construction will not be equalled by any other make.



Our experience of 21 years in the manufacture of this line of goods,—being the oldest manufacturers,—justifies us in making the claim that our product has merits not found in other makes of Stoves in this line, notwithstanding that our lists, discounts and terms are the same as other manufacturers'.

All orders intrusted to us will have our careful and prompt attention. For further information we invite correspondence.

The Dangler Stove & Mfg. Co.,
Cleveland, Ohio, U. S. A.

JEWEL STOVES AND RANGES.

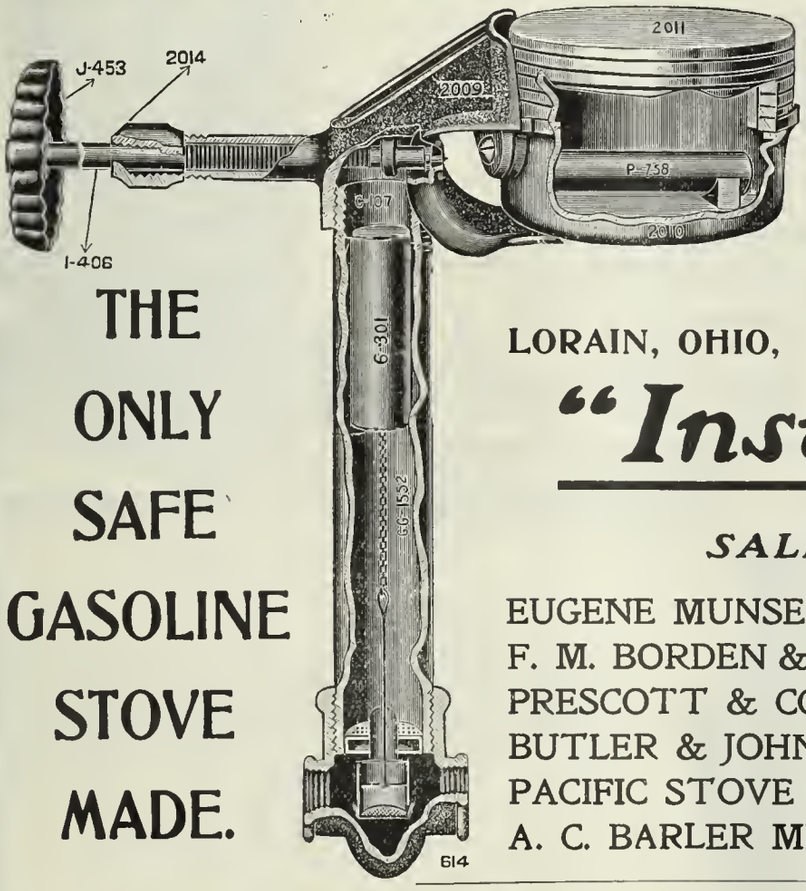


A Complete, Well Advertised Line; Low Prices and Good Workmanship.

Please Write for Catalogue.

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Detroit - Chicago.



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THE ONLY SAFE GASOLINE STOVE MADE.

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"Insurance"

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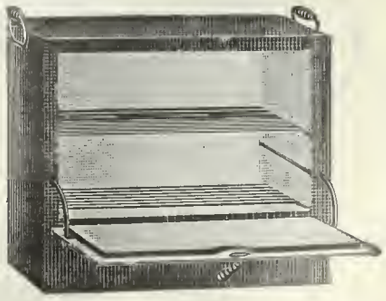
ACME LINE, 1902.

Asbestos Lined Ranges and Ovens, Cookers and Hot Plates.

FOR ALL GASES.



Catalog No. 35 on application.



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PITTSBURG, PA.

HENRY WATERMAN, - - 195 Lewis St., N. Y., Eastern Agent.

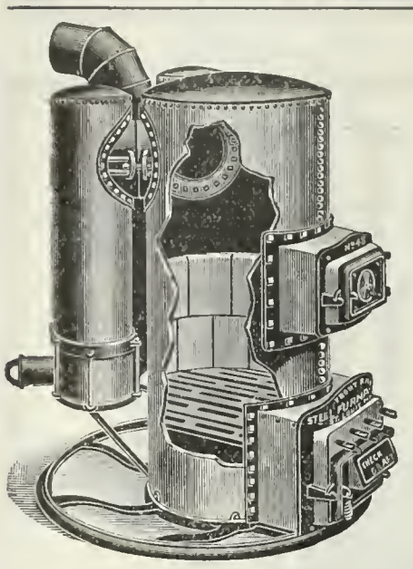
OUR CATALOGUE,

SHOWING

GAS RANGES
CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS

WILL BE FURNISHED FOR THE ASKING BY

Enterprise Stove Co., VINCENNES, IND.



Front Rank Hot Air Furnaces

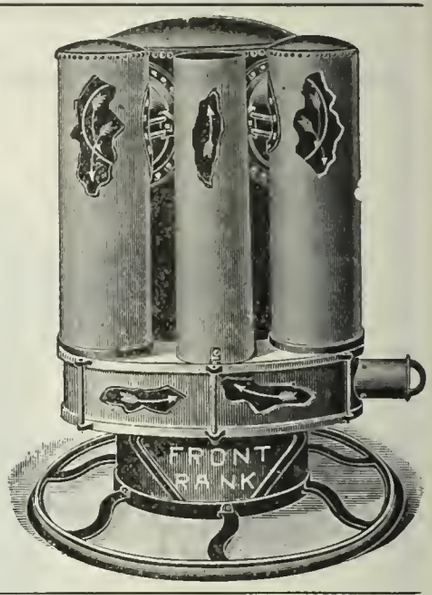
are built on vertical lines; air comes in direct contact with entire heating surface.

The Front Rank Fire Chamber is one solid sheet of closely riveted steel; being lined above the fire lines with genuine fire clay tiling it is the most durable made.

The radiators are very large and have an unusual area of heating surface in comparison with the size of fire pot.

These furnaces burn hard or soft coal or coke. We also make wood burning furnaces.

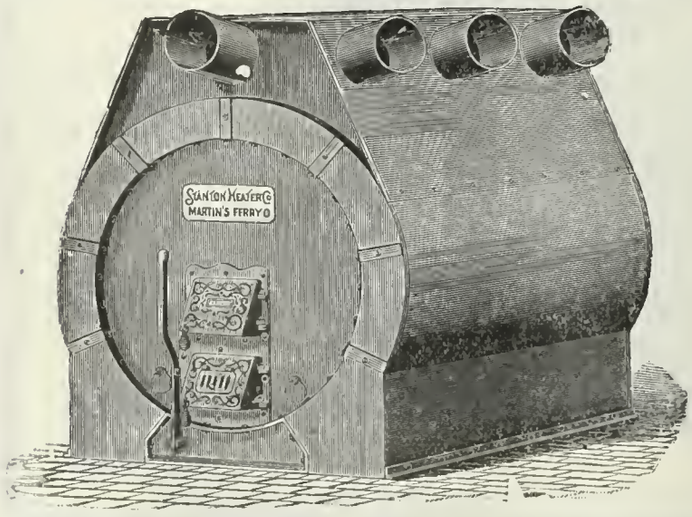
Send for our catalogue, it will give you a better idea of what we make.



FRONT RANK STEEL FURNACE CO.,
2301 to 2309 Lucas Ave., St. Louis, Mo.

The Stanton Seamless Heater,

PORTABLE CASED.



STATE COLLEGE, PA., June 15, 1900.

THE STANTON HEATER CO., Martin's Ferry, Ohio.

GENTLEMEN:—The Stanton Heater is giving the best kind of satisfaction. It will produce good heat from any kind of fuel. My average cost of fuel, per month, for the past winter was three tons of coal dust from soft coal to heat 43,000 cubic feet of space with a No. 68 Heater: however, this space is 3,000 cubic feet over the capacity of your Heater, but the heater did the work easy, and held the temperature in zero weather so it would not change over four degrees in twelve hours without touching the Heater.

The Stanton Heater is, in my judgment, the most modern and economical warm-air generator of this age.

Sincerely yours, J. N. KRUMRINE.

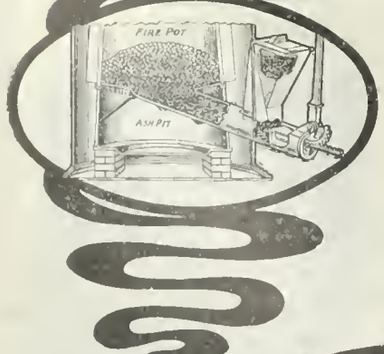
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THE STANTON HEATER CO.,
Martin's Ferry, Ohio.

See Our Advertisement Next Week.

IF YOU ARE NOT SELLING THE

Peck-Williamson Underfeed Furnace



you have not the trade and are not making the money you might. Just a pull or two of the lever feeds the new coal from underneath.

The Underfeed Furnace consumes less fuel than any other furnace ever built. The coal is burnt more slowly. All the heat units from it, as well as from the smoke, are utilized and all smoke eliminated.

Our handsome booklet explains its splendid heating qualities and coal saving.

You may have this booklet and our special plans for selling. Ask for booklet about our Laundry Dryer also.



THE PECK-WILLIAMSON COMPANY,
CINCINNATI, OHIO.

THE H.B.SMITH CO.,

WESTFIELD, MASS., U.S.A.

Catalogue furnished only upon application to

Heating Contractors, Engineers and Architects

64 Pages. Size 9 x 12 Inches.

INDIRECT RADIATORS

(16 STYLES)

PACIFIC COAST AGENTS

HOLBROOK, MERRILL & STETSON,

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SALESROOMS:

THE H.B.SMITH CO.,

133 CENTRE STREET,
NEW YORK.

510 ARCH STREET,
PHILADELPHIA.

HIGH GRADE HEATERS.

Some Dealers Look

to the profit they make on the sale of a single furnace, and if a cheap furnace is used the profit looks large when the contract

Is Made

When this cheap furnace fails to heat, and gives out in the middle of winter, the dealer is obliged to alter and readjust the setting, secure repairs for his furnace, and in the end the entire profit

Is Wiped Out

and great disgust follows to both the purchaser and the dealer.

OTHER DEALERS INSIST

on using

Good MATERIALS WORKMANSHIP FURNACES.

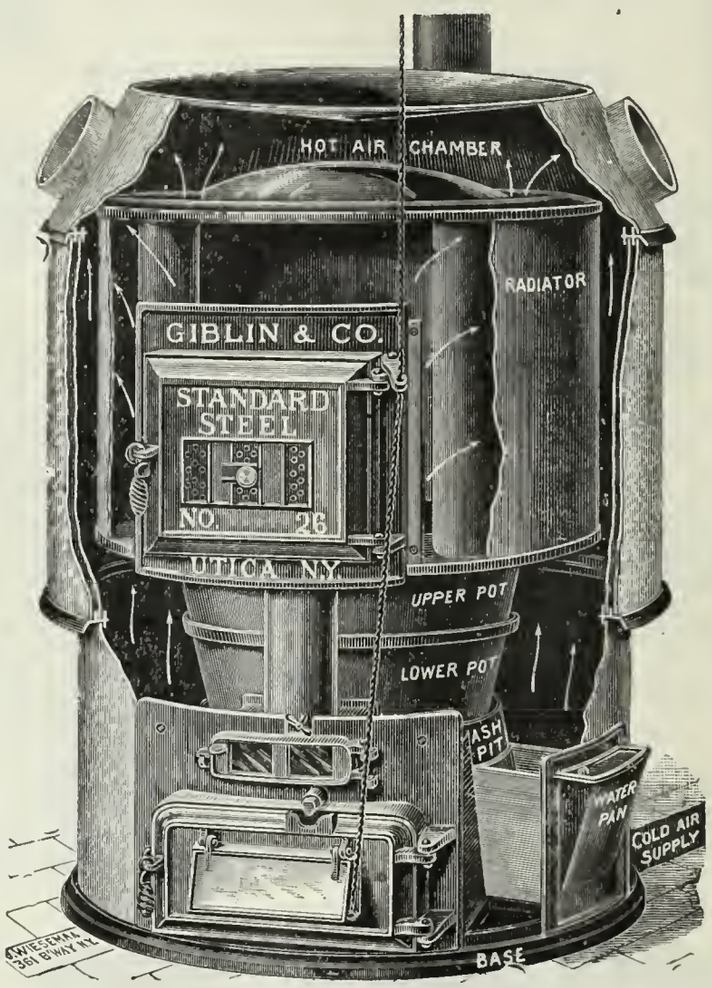
The result of such choice is satisfactory heating, pleasant feelings between the purchaser and the dealer, and the

WARMEST RECOMMENDATION

of the furnace and the dealer.

A GOOD BUSINESS REPUTATION

is obtained, and when good work is wanted this dealer is sought out and fair prices paid for his work.



The Basis

of all heating is a

Good Furnace,

one that is **SIMPLE** in operation, **ECONOMICAL** in fuel and **LONG-LIVED** without the need of repairs.

The furnace shown here has all these merits, and the actual use of

Many Thousands

of these heaters has demonstrated its superiority.

FURNACE DEALERS

who are trying to establish a

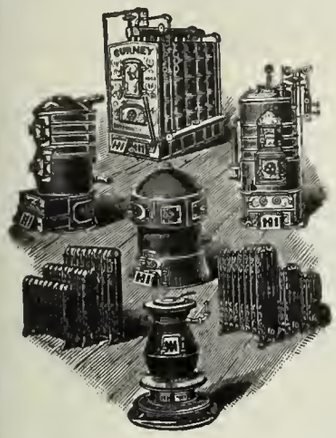
Good Furnace Business

should place themselves in communication with us, obtain our catalogue, see the line of heaters we make and get in position to do business on a good basis for the balance of the year 1902.

Our Prices are reasonable, and our treatment of our customers is

More Reasonable.

GIBLIN & CO., Utica, N. Y.



Gurney Heaters

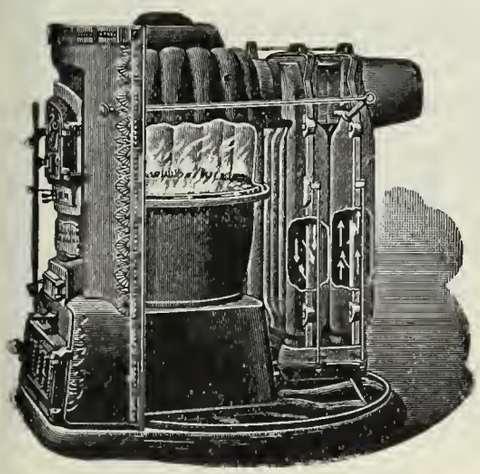
Provide every advantage a heater can provide,—the very best material, the most durable and approved construction, insuring the greatest efficiency from the least possible consumption of fuel.

CAPACITIES FULLY GUARANTEED.

Don't you wish to handle the BEST? Send for our latest trade catalogue.

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111 Fifth Ave., New York City.

Western Selling Agents, JAMES B. CLOW & SONS, 222-224 Lake St., Chicago, Ills.



Bengal Furnaces.

EASY TO SELL. SURE TO PLEASE.
LEADERS OF THEIR CLASS.

3,500 square feet of radiating surface—more than any other furnace their SIZE.

ALL CAST IRON.

Secure a BENGAL AGENCY at once.

CATALOGUE ON APPLICATION,

EASTERN SELLING AGENTS:
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Washington, Hanover and Elm Streets, Boston, Mass.

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FOR WOOD.

Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces. . . .
Furnished for either Brick or Galvanized Iron Casing

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NEENAH, WIS.

BRAND STOVE CO.

STOVES, RANGES and FURNACES.

SEND FOR CATALOG.

MILWAUKEE, WIS.

Gurney

HOT WATER GENERATORS
HOT AIR GENERATORS
STEAM GENERATORS
RANGES *and* STOVES
REFRIGERATORS
STEEL RANGES
GAS RANGES
FURNACES

GURNEY AND COMPANY
WASHINGTON, HANOVER AND ELM STREETS
BOSTON, - MASSACHUSETTS

IT will pay you to know all about the "DIGHTON" Furnace so that you can talk intelligently when your customer asks about it.

Don't attempt to tell him "it isn't any good,—that the one you are agent for is better."

If he speaks about the "DIGHTON," the chances are he knows somebody that's got one and quite likely it may have been in a place where conditions allowed of a fair comparison with yours.

Don't be surprised if he tells you that the "DIGHTON" consumed a ton of coal less than yours in heating a nine room house.

We believe there isn't another Furnace made that will heat a given number of feet of space with as little fuel as the "DIGHTON."

We **know** that a fair test where conditions allow of comparison will thoroughly convince **you** and we shall have one more loyal supporter of the "DIGHTON."

DIGHTON FURNACE CO., - Taunton, Mass.

THE HAXTUN

DEFENDER

GREAT NORTHERN

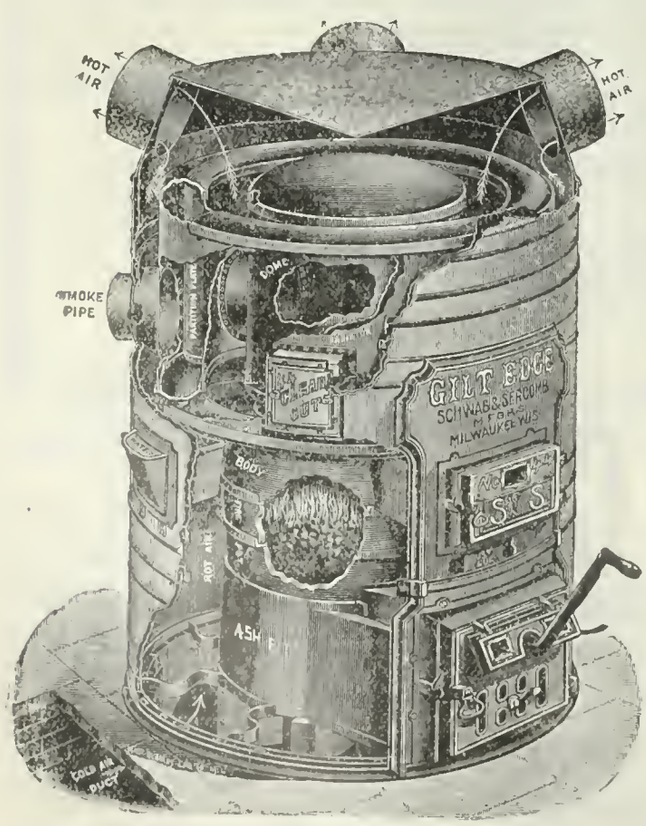
THE SUPERIOR

TABASCO

DON'T

look any further if in search of boilers for steam heat or hot water. The list opposite contains the standards. Send for catalog and get acquainted with them.

KEWANEE BOILER COMPANY
KEWANEE, ILLINOIS.



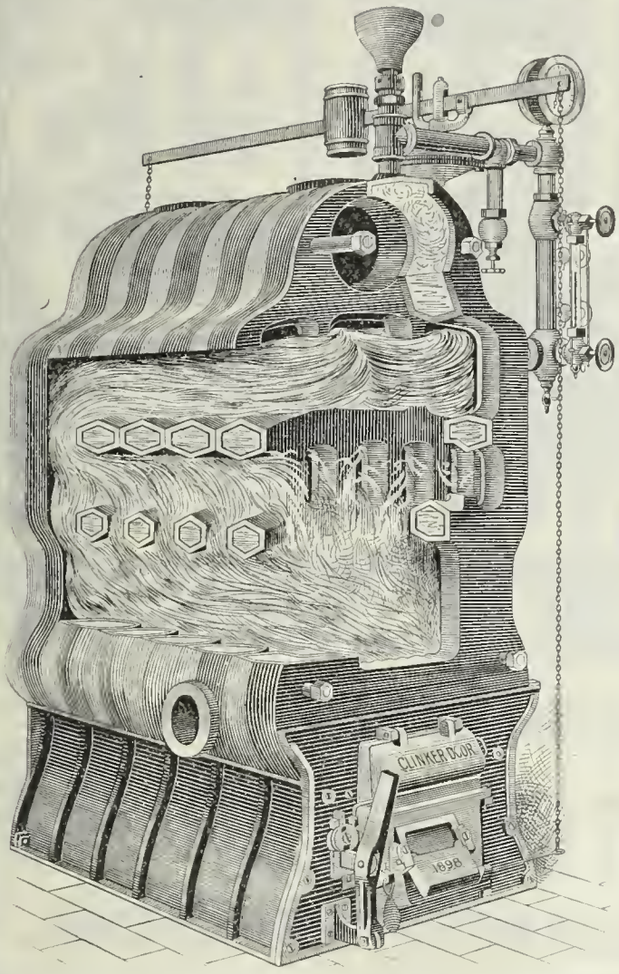
Gilt Edge Warm Air

AND

Combination Heaters

have merits that are all their own. They are made in a large variety of styles and sizes, each adapted especially to a certain class of fuel. We are manufacturers of a complete line of Warm Air Registers, Safety Pipe and Tin Galvanized Iron Furnace Fittings.

R. J. SCHWAB & SONS CO.,
MILWAUKEE, WIS.



IDEAL SECTIONAL STEAM BOILER.

Ideal Boilers

will be more popular than ever in 1902, and we shall be prepared to give even better service than during the past busy year.

Have you our Catalog?

AMERICAN RADIATOR COMPANY

CHICAGO.

New York, Philadelphia, Buffalo,
St. Louis, Minneapolis, Denver.

Furnace and Kettle

FOR

BUTCHERS' USE.

UNEXCELLED.



MADE IN SEVEN SIZES.

Furnace: Modern construction so that drafts are applied directly against the kettle, securing the greatest results from the least amount of fuel.

INTERIOR OF KETTLE PERFECTLY SMOOTH and CIRCULAR.

GIBLIN & CO., Utica, N. Y.

Prices and Discounts Quoted on Application.

Royal Heaters.

MANUFACTURED BY THE

HART & CROUSE Co.

UTICA, N.Y.

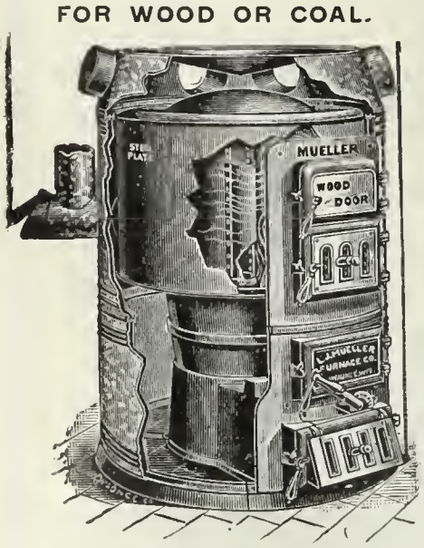
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STEAM, HOT WATER & HOT AIR,

FOR HEATING ALL CLASSES OF BUILDING.

235 WATER ST., N.Y. BRANCHES. 79 LAKE ST., CHICAGO.
COLUMBUS, O. ST. LOUIS.

FOR WOOD OR COAL.



MUELLER

Furnaces and Boilers

FOR ALL KINDS OF FUEL.

Everything in the Heating Line.

Get Our Special Register Offer.

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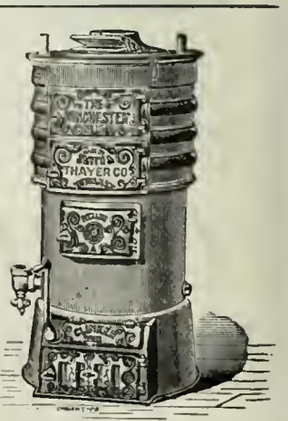


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WINCHESTER

The Heater manufacturer who jea'ously guards the Integrity of its customers Is the one the fitter ought to help. To aid the fitter to secure orders for the best of articles elevates the entire trade We aim to have the "WINCHESTER" heater the best of its kind. If we do not accomplish this, we can at least say that it has no superior. Smith & Thayer Company, Boston, Mass., 105 Beekman St., New York.



HEATER.

They regulate heat in residences, offices, stores, mfg. plants. Guaranteed.

The Howard Thermostat Co.

West Water Street, Oswego, N. Y.

No electricity or compressed air Simple as a heavy spring motor can be.

Would like to send you their catalogue and give a few reasons why you should sell their Heat, Valve, Draft and Damper Regulators. This should be an interesting topic. We have the most simple thermostat made; also the most sensitive. Only three parts—a sensitive and powerful sensitive plate, a heavy spring motor made of brass. and common pulley connections. Just enough material to do the work satisfactorily, but not one atom too much. They do "straight work," without the aid of outside agencies. No other thermostat on the market can do more with all of its electricity and compressed air connections.

THEY SAVE THE COAL

WHICH IS WASTED BY THE WRONG OPERATION OF FURNACE OR BOILER DAMPERS.



WHAT WE CLAIM.

"52 Years of Success"

A construction from which the greatest possible amount of fresh warm air can be obtained with the least amount of fuel. . . . . .

A PLEASED BUYER SAYS:

"I have used *twenty-five of your furnaces* in new houses I have built, and I shall continue to use them in preference to all other furnaces I have tried, and I have tried many kinds. They give the best of satisfaction in every case. I have a No. 48 Thatcher Tubular in my own house and I find it easy to run, economical, and a great heater. I cheerfully recommend it to all who wish to be warm and comfortable on a cold winter day."

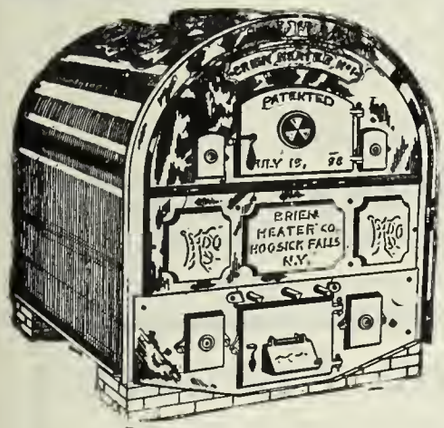
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WARM AIR FURNACES, RANGES, STEAM AND HOT WATER HEATERS.

Works: NEWARK, N. J.



Brien Heater.

A perfect, all cast WOOD or COAL burner. There is no other Hot Air Furnace as low down as the "BRIEN."

Write for territory, catalog and prices.

BRIEN HEATER CO.,
HOOSICK FALLS, N. Y.



CABINET PORTABLE OVEN.

OUR LATEST PRODUCTION.

BAKES EVENLY BY THE CIRCULATION OF HOT AIR.

FOR BAKERS, CONFECTIONERS, HOTELS,

Also the best oven for Core Baking, Japanning, Enamelling, etc.

Made in six sizes, single and double, for coal, wood, natural or artificial gas.

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BOILERS and RADIATORS

for Steam and Water Heating.



Pierce Touraine Steam Boiler.

LARGE HEATING CAPACITY.
ECONOMIC IN FUEL CONSUMPTION.

Endorsed by the foremost Architects and Heating Engineers.

Write for New Illustrated Catalogue.

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HOT WATER AND HOT AIR

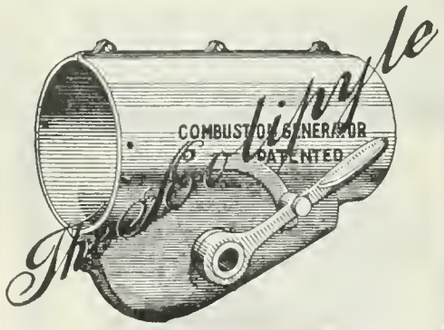


HEATING BY COMBINATION STOVES AND FURNACES.

Suitable for Large or Small Houses, Stores, Conservatories, Barber Shops, Hotels, etc., etc.

Heat Water Quickly.
Circulation is Positive.
No Joints Inside to Leak.

THE NATIONAL PIPE BENDING CO
160 RIVER ST., NEW HAVEN, CONN.



Saves Coal, Increases Heat,
Keeps Temperature Even,
Prevents Escape of Coal Gas,
Reduces Labor,
Avoids Sifting Ashes,

When Applied for Domestic Use to Smoke Pipe of

House Furnace,
Hot Water Heater,
Low Pressure Boiler,
Stove or Range.

Æolipyle Company,
237 Water St., New York,
Tel. 1849, John. U. S. A.

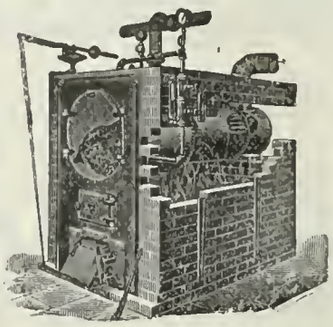
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1311-1315 Capouse Avenue, SCRANTON, PA.
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OUR "BLACK DIAMOND" artificial abrasive wheels are especially adapted for The Stove Trade
THEY ARE THE BEST.

STAMFORD FOUNDRY COMPANY

MAKERS OF

RANGES COOKING AND HEATING STOVES
HOT-AIR AND COMBINATION AIR AND WATER FURNACES
LAUNDRY STOVES CONFECTIONERS' STOVES
CABOOSE RANGES ETC ETC

STAMFORD CONN

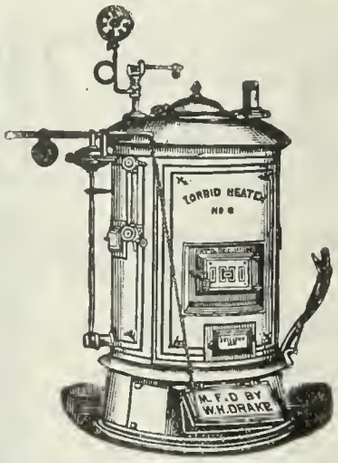


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The most economical Steam and Hot Water Boiler on the market. Write for Catalogue and Price List.

VANCE BOILER WORKS,
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"TORRID HEATER."
FOR STEAM OR HOT WATER.



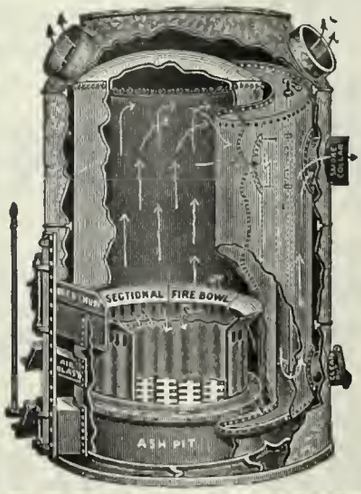
It is Practical in Design.
It is Safe, Being Tested to 200 Pounds.
It is Easy to Manage and Keep Clean.
It is Durable.
It is Sectional and Easily Handled.
It has No Packed Joints.
It is Self-Feed or Surface Burning.
It has the Torrid Patent Rocking and Dumping Grate.
It is Low in Price.

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W. H. DRAKE, No. 36 Clinton St. NEWARK, N. J.
Factory: Hackettstown, N. J.

The Torrid Zone Furnace



is a trade winner because it has points of merit peculiar to itself that can be found in no other steel furnace. Our new catalogue is now ready to mail and a description of our Hot Air and Hot Water Combination Furnace can be seen in it. We furnish either the cast iron lining or the fire brick at the same price. Our Wood Furnace is called a powerful heater by those who use it.

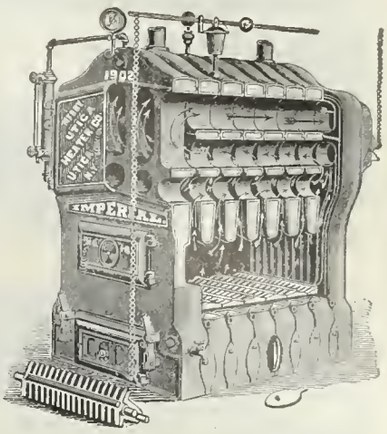
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Lennox Manufacturing Company,
Eighth Ave. and Frederick St.,
MARSHALLTOWN, IOWA.



1902

Proclamation



WHEREAS, It has come to our knowledge that it is your intention and desire to handle the best line of HOT AIR FURNACES for your requirements during 1902,

WE HEREBY PROCLAIM that we are manufacturing the best line of Hot Air Furnaces, and Steam and Hot Water Boilers for first-class Heating Contractors and Dealers, under special features, Short Prices and Reasonably Long Terms for February, March and April shipments. We will be pleased to mail you catalogues and quote you discounts on application.

REMEMBER, we do NOT belong to any trust, combination or association; and therefore are not compelled to consult any one outside our office as to the conduct of our business.

REMEMBER, ALSO, that we manufacture Hot Air Furnaces, Steam and Hot Water Boilers of all Grades.

Please let us hear from you.

UTICA HEATER COMPANY,

UTICA, NEW YORK.

The Champion Hot Water Combination Boilers.

They Fit Any Furnace.



Base section when used without ring sections.



Ring Section.

These Boilers are made in three sizes diameter, and from 100 to 600 square feet radiation capacity.
Will heat those cold rooms, or an addition to the building. Will increase the capacity of any furnace. Are cheaper than coils and will do more work.
Write for new circular. Manufactured by

FRANK D. STOLZ,
115 Lake St., Chicago, Ill.

We Protect Dealers

WHO HANDLE BURTON'S

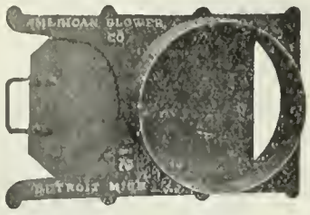


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Give us a trial order.

W. J. BURTON & CO.,
164-166 W. Larned Street, Detroit.

The "A B C" Blast Gates.



Simple, Effective,
For closing pipes in exhaust, blast and heating systems.
Send for price list.

American Blower Co.,
Detroit, Mich.
New York. Chicago. London.



WE don't expect you to buy Independent Registers unless it is to your advantage. But let us quote our prices.

Independent Register Co.,
152 Champlain St.
CLEVELAND, O.

Champion and Marquart Double Flue Ranges.



Only Double Flue Ranges in the Market. The Greatest Fuel Saver. Draw-Out Grate.

Handsomely Finished Throughout. Prices Within Reach of all.

CHAMPION STEEL RANGE CO.,
CLEVELAND, O.

We are represented by the following houses:
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Chicago Stove and Range Co., Chicago, Ill.
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Corbett, Failing and Robertson, Portland, Ore.
Palmer Hdw. Co., Savannah, Ga.

J. M. Litchfield, New York, N. Y.
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AHEAD AS USUAL.

We have not only stood the test of time, but look at the result of physical test of Quimby Engineering Company before Building Committee, on competition for public work in an Eastern city.

QUIMBY ENGINEERING COMPANY.
PHILADELPHIA, PA., Aug. 5, 1901.

MESSRS. J. H. McLAIN Co., Canton, O.

Gentlemen:—We hereby certify that one-half section of the Cornell Boiler was tested by us to destruction to-day, and that it was ruptured at Two Hundred and Fifty Pounds per square inch hydraulic pressure. Very respectfully yours,
QUIMBY ENGINEERING CO.,
H. H. Quimby, Proprietor.

Attest: JOHN M. LUKENS,
Chief of Bureau of Steam Engine and Boiler Inspection, City of Philadelphia.

It Clearly Puts Our "Cornell" IN A CLASS BY ITSELF.

Think of it—250 pounds pressure on a Cast Iron Boiler. This is the only kind of Boiler that is good enough for you. We make all our Boilers of the different styles the same way—the right way.

Have you our new Booklet, "Truth About Heating?"

THE J. H. McLAIN CO., Canton, Ohio.
"Everything for Heating."
NEW YORK. CHICAGO. INDIANAPOLIS. PHILADELPHIA.

AN OBEDIENT CHILD MINDS NO BETTER THAN A

RICHMOND HEATER.

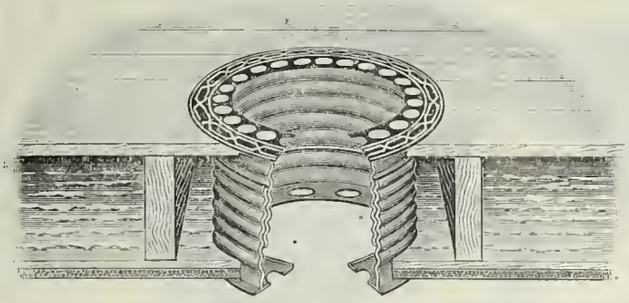
IT ALMOST TAKES CARE OF ITSELF.
IT HEATS YOUR HOUSE FROM CELLAR TO GARRET WITH LITTLE FUEL.

Write for Catalogue.

Richmond Stove Co., Norwich, Conn.



PATENTED IN U. S. and CANADA.



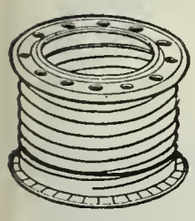
THE O. K. IS A NOVELTY.

THE EASILY ADJUSTED

O. K. STOVE PIPE THIMBLE

FOR PARTITIONS AND CEILINGS.

Made in two parts which screw together and adjust to any thickness of floor or partition. They hold the plaster firmly and are not loosened by any agitation of smoke pipe. Have no springs to get out of order or no loose parts. Made of bright tin with ends handsomely japanned.



Price Same as Other Old Style Thimbles.

Trial orders solicited through jobbing trade or direct. Travellers' model samples supplied.





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CANADIAN REPRESENTATIVES,
THE METAL SHINGLE & SIDING CO., Ltd., Preston, Ont.

20th Century Gas Stoves

THE BEST GAS STOVE MADE.

Best Materials and Workmanship. Prices Low. Mail Orders Promptly Filled.

STOVE REPAIRS IN STOCK
FOR 2,000 STOVES AND RANGES.

Write for Prices.

THE METROPOLIS SHEET METALS AND STOVE REPAIRING CO.,
261-261½ Springfield Ave., Newark, N. J.

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EUGENE MUNSELL & CO.
MINERS & IMPORTERS.
NEW YORK. CHICAGO
218 WATER ST. 117 & 119 LAKE ST.

SELECTED

MICA

ONLY.

Prepared expressly for the Stove and Hardware Trade.

Two Grades: "North Carolina" and "Nevada."

PRICE LISTS AND DISCOUNTS SENT ON APPLICATION.

THE PALERMO MICA CO.,
115 Beekman St., New York.

MICA

Specially Prepared for the Stove Trade.
OHIO MICA CO., CANTON, OHIO

FOR **MICA**

Sheet, cut or uncut, Powdered and Flake,

WRITE TO

ASHEVILLE MICA CO.,
ASHEVILLE, N. C.

STOVE REPAIRS.

Stove dealers' SUPPLIES of all kinds.

Water Fronts a Specialty.

WE GUARANTEE PROMPTNESS IN FILLING ORDERS

Catalogues, Order-Books, Postals or Envelopes sent upon application.

Largest Jobbers in New England

HENRY N. CLARK CO.

56 and 58 Union St.,

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STOVE BANDS

—AND—

RINGS.

SPECIAL TUBING.
Cut to Length and Plated.
FLAT STRIPS & CORNERS.
SPECIAL
PUNCH PRESSWORK
SOLICITED.
Quality and Finish the Best.

The Kirk Manufacturing Co.,
TOLEDO, - - - OHIO.

PATTERNS

FOR STOVES AND HEATERS.
First-class in wood and iron.
Vedder Pattern Works, - Troy, N. Y.

By Thos. McNeil

THE STEAM AND HOT WATER FITTERS' TEXT BOOK.

140 Pages. Cloth.

TELLS HOW

To Estimate Radiation.
To Plan a Hot Water Job.
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Heating with Exhaust Steam.
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Explains Steam Traps and Automatic Pump Governors.
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And Many Other Important Things that Good Workmen Must Know.

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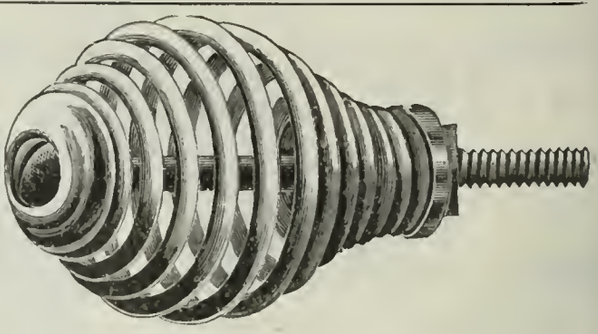


Hand Elevators and Dumbwaiters

Made to be sold by the Hardware Trade. Can be placed in position by any carpenter. Catalogue free.

ENERGY ELEVATOR CO.,
408 Cherry St., Phila., Pa.





TROY NICKEL WORKS, - Albany, N. Y.

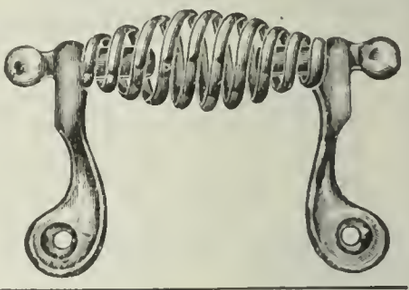
ESTABLISHED 1880.

All The Latest Novelties in Stove Trimmings.

ALWAYS COLD.

If you want your stoves up-to-date you must use Alaska Stove Trimmings.

SEND FOR CATALOGUE.



The Merchant



Who sells cheap goods at cheap prices cannot expect to enjoy his share of the general prosperity of the country.

Standard goods at moderate prices is the correct motto.



RUTLAND FIRE CLAY CO.,

60 Wabash Ave., CHICAGO, ILL.

NORTH EAST. MD.

Rutland, Vt.



"O.H." ONE PIECE STOVE PIPE Elbows

Perfectly round and true to size. With long ends, DOUBLE LOCK SEAM in throat or under side of Elbow.

HANDSOMEST, HEAVIEST AND STRONGEST STOVE PIPE ELBOW MANUFACTURED.

—SOLE MANUFACTURERS,—

THE LAWRENCE-LETTS ELBOW CO., Ltd., - - Waverly, N. Y.

THE GEORGE W. COPE Stove Pattern Works.

ORIGINAL, ARTISTIC AND PRACTICAL CONSTRUCTION.

Cor. Randolph and Atwater Sts., DETROIT, : : MICH.

The Milwaukee Pattern Works.

Ornamental and Stove Patterns.

Sketches and Designs for Stove Work of all kinds.

Correspondence Solicited.

506-507 Cedar Street, MILWAUKEE, WIS.

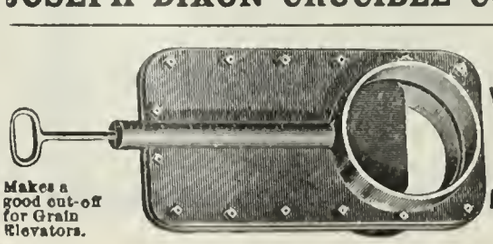
Stove Dealers

will make money and save money by using

Dixon's Graphite Cement.

There is nothing equal to it for repairing fire brick in stoves, furnaces, etc. Let us send you sample and prices.

JOSEPH DIXON CRUCIBLE CO., - JERSEY CITY, N. J.



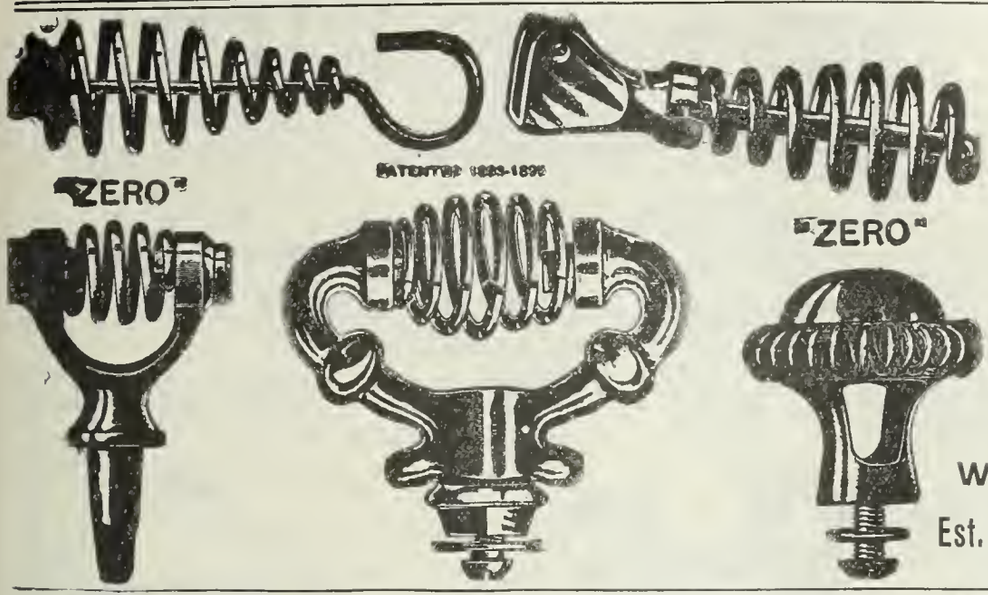
Makes a good cut-off for Grain Elevators.

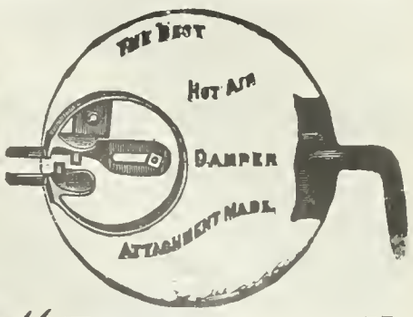
IMPROVED WIND-GATE

SEND FOR PRICE-LIST AND DISCOUNT TO

MINER & PECK MFG. CO.,

NEW HAVEN, CONN.





"ZERO" WIRE GOODS.

Manufactured by
W. H. SHIELDS & CO.,
Successors to
Est. of W. F. GREENE,
TROY, N. Y.

MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

RANGE, STOVE AND HEATER REPAIRS

AND FIRE-BRICK LININGS,

74 Beekman Street, New York,

FOUNDRY,
Perth Amboy, N. J.

FIRE-BRICK FACTORY
36 to 46 South Fourth Street, Brooklyn, L. I.

BRANCH STORES:
South Fourth Street, Brooklyn, L. I. 362 Grove Street, Jersy City, N. J.

CATALOGUES NOW READY.

FIRE BRICK LININGS

For all Stoves, Ranges and Heaters.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.

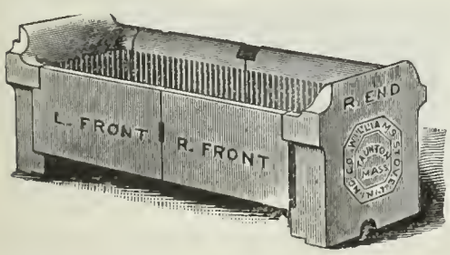
M. D. VALENTINE & BRO CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBRIDGE. N. J.

BRICK STOVE LININGS.



Eagle Stove Clay.
Incandescent Gas Fuel.

WILLIAMS STOVE LINING CO.,
TAUNTON, MASS.

SPINES FOR ALL

It is the polishers' friend, and will polish anything. Write for free sample to
297 E. Washington St.,
Ind'p'l's,



GEO W. HOFFMAN.



DO you want Stoves and Heaters that are easily sold and *STAY SOLD?* We have been very successful in designing patterns for such.

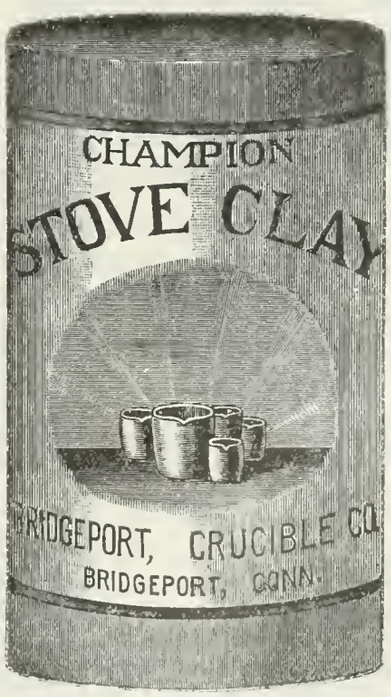
THE GOBEILLE PATTERN CO.,

CLEVELAND, OHIO.

HANDLE THE BEST:

CHAMPION STOVE CLAY

Is the only brand made of crucible materials, viz.: Imported German Fire Clay and Plumbago from Ceylon.



Dealers are invited to send for circulars.

Packed in neat, attractive, round pasteboard boxes of three sizes: large, medium and small, holding about 10 lbs., 6 lbs. and 2½ lbs., respectively.

ALSO SOLD IN BULK.

Your jobber can furnish the goods.

BRIDGEPORT CRUCIBLE CO.
Bridgeport, Conn.

L. WOLFF
Manufacturing Company,

General Office,
93 W. Lake Street, CHICAGO.

WOLFF'S IMPROVED PLUMBERS' FURNACE,

The "DURO."



THE "DURO" "F" 1241.

PRICES UPON APPLICATION.

Quantity shipments are packed in cases 6 and 12 furnaces each.

The "DURO" Plumbers' Furnace

Has Drawn Steel Reservoir
Heavily Galvanized.

Drawn Steel Coil Cup.
Wrought Steel Bottom.
Patent Wire Handle.
Improved Filling Plug.
Safety Air Cock Joints.
No Cast-Iron Parts.

It weighs less than any other Furnace now in use.

In placing on the market

Our Improved Plumbers' Furnace

we have fully succeeded in producing ***the best furnace made.*** Most perfect in every detail. Of the highest efficiency. In operation, positive and reliable. Of substantial construction; combining lightness, strength and durability, at no more cost to the trade than the old style.

All component parts are interchangeable, being accurately made and fitted before shipment.

Illustrated Catalogue and Price-List sent upon application.

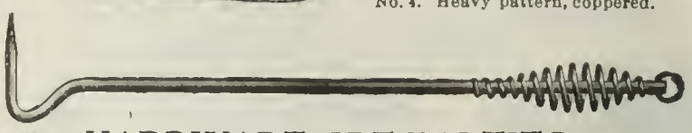
JOHN H. LAWLESS,
Plumbers' Force Pumps,
184-186 Third St., Jersey City, N. J.
WRITE FOR CATALOGUE.

STOVE POKERS and LIFTERS.



Arcade Plain Cast Lifter.
No. 3. Light pattern, coppered.
No. 4. Heavy pattern, coppered.

"Siberian" Poker.
Either bent or straight ends; length, 20 in.



Manufacturers of HARDWARE SPECIALTIES.

WRITE US FOR PRICES.

ARCADE MANUFACTURING CO., - FREEPORT, ILL.

WHY

ARE OUR CUSTOMERS ALWAYS

SATISFIED?

BECAUSE our GOODS are BEST,
PRICES are RIGHT and
SHIPMENTS are PROMPT.

WE ARE

HEADQUARTERS

FOR ALL

Plumbing Specialties.

LET US QUOTE PRICES.



Helpers' Friend Combination Plumbers' Furnace.

Faultless Bibb Seat Dressers.

Brass Basin Taps.

PLUMBERS' RUBBER and LEATHER GOODS.

CONNECTED WASTE and OVERFLOWS.

GASOLENE and ALCOHOL APPLIANCES.

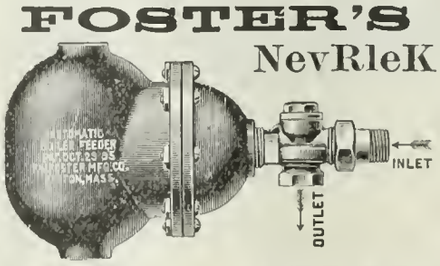
American Distributing Co.,

FACTORY: 200-202-204 Decker St.,

H. ROMEYN SMITH, Pres.

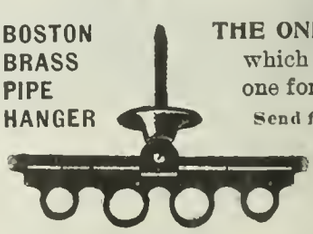
SYRACUSE, N. Y.

FOSTER'S NevRleK



BOILER FEEDER.
Our Booklet tells all about it.
F. W. FOSTER MFG. CO.,
12 Portland St., Boston.

BOSTON BRASS PIPE HANGER



THE ONLY ONE which requires but one form of holder

Send for Circular.

JOSEPH H. YOUNG.
Boston, Mass.



GALVANIZED STEEL and WOOD TANKS.

All sizes and shapes.

J. H. EDWARDS,
59 Park Place, N. Y.

PLUMBERS WANTED!

To Use **ALLBE'S WIPING CLOTHS.**

Herringbone, A. Moleskin, B. Common Tick, C.

3½ x 3 and smaller.		
15c.	20c.	10c.
3½ x 3½ to 4 x 5		
20c.	25c.	15c.

In ordering state size of wiping edge first.
U. S. Stamps taken. Made by

Chas. A. Allbe,
588 Union St., - Springfield, Mass.

Leather and Rubber

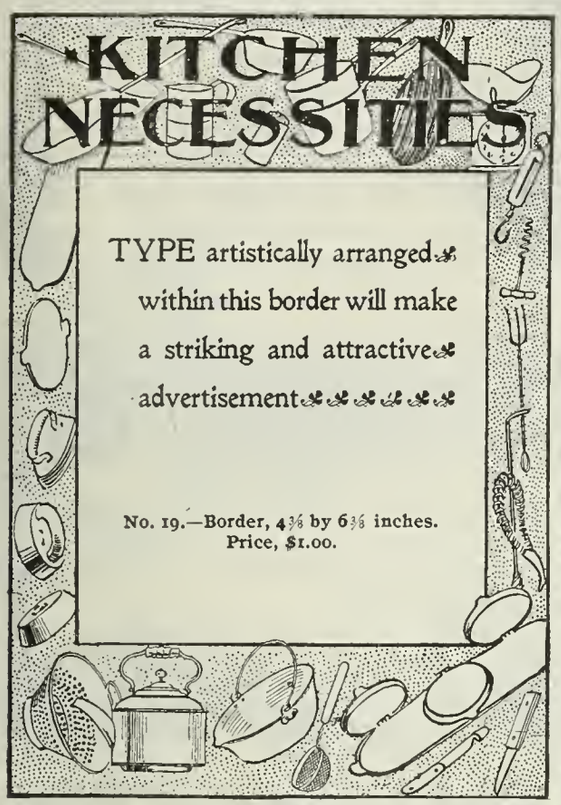
WASHERS,

Machine cut, at less price than can be cut by hand. Send Sample for prices.

I. G. MARSTON & CO.,
200 Ruggles St., Boston, Mass.

ADVERTISING CUTS

The cuts illustrated on this page will be useful to Furnacemen, Plumbers, Stove Dealers and House Furnishers, for newspaper or circular advertising, letter heads, &c. ***The cuts are shown reduced to 3-5 actual size.***



No. 19.—Border, 4⅜ by 6⅜ inches. Price, $1.00.



No. 15.—Price, 50 cents.



No. 24. Price, 50 cents.



No. 20.—Price. 50 cents.



No. 30.—Price, 50 cents.



No. 29.—Price, 50 cents.



No. 32.—Price, 50 cents.



No. 33.—Price, 50 cents.



No. 36.—Price, 50 cents.



No. 39.—Price, 50 cents.



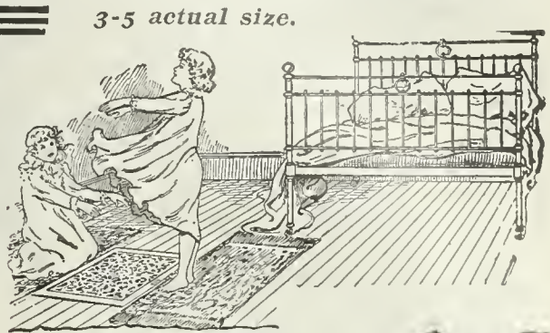
No. 41.—Price, 50 cents.

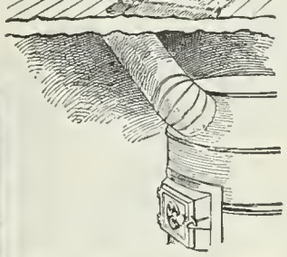


No. 45.—Price, 50 cents.



No. 44.—Price, 40 cents.





No. 42.—Price, 75 cents.



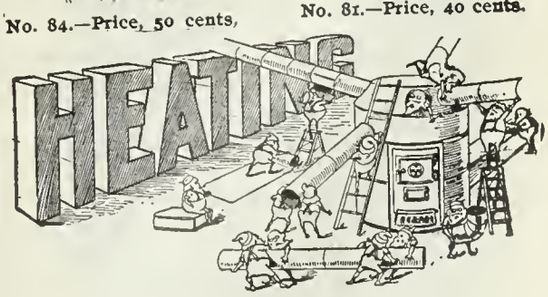
No. 47.—Price, 50 cents.



No. 48.—Price, 50 cents.



No. 84.—Price, 50 cents.



No. 75.—Price, 75 cents.



No. 46.—Price, 50 cents.



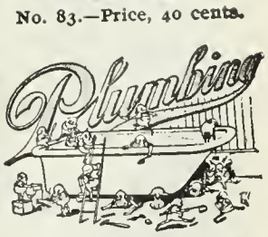
No. 61.—Price, 50 cents.



No. 78.—Price, 25 cents.



No. 83.—Price, 40 cents.



No. 81.—Price, 40 cents.

The Advertising Cuts illustrated above are reproduced 3-5 of the actual sizes.

Cuts Nos 81 and 83 are also sold in larger sizes—viz , No. 81, 4½ in. wide and 3 in. deep, price 75 cents, and No. 83, 4 in. wide and 2½ in. deep, price 75 cents.

We have numerous other cuts for advertising hardware, kitchen and household articles, cutlery, mechanics' tools, &c. These include cuts of various unique designs, together with a line of 128 cuts each giving a small, accurate illustration of a salable article.

A 16-Page illustrated circular and price-list of advertising cuts will be mailed on application.

Sent prepaid by DAVID WILLIAMS COMPANY, 232-238 William Street, N. Y.

ABOUT ESTIMATE BOOKS

For Plumbers and Heating Men

Your Contract and Estimate Record Book for Plumbers is one of the best books that ever came into our house and we would not be without it for three times the amount it cost. We can figure without omitting anything with accuracy at a very short time. We think that every plumber should not be without this valuable book.

W. C. BENNETT & CO., Haverhill, Mass.

We have used an estimate book for three years and could not do without one. Would say that yours is far superior to any yet used and can cheerfully recommend it.

W. R. PARK & SON, Taunton, Mass.

A great advantage. Prevents the leaving out of small items, which amount to more than the cost of the book in a very short time.

CHAS. W. COOMBS, Lawrence, Mass.

Your Contract and Estimate Record Book has been of great use to me in both the saving of money and labor, and I would highly recommend it to any or all master plumbers.

THOMAS P. DOHERTY, Taunton, Mass.

These testimonials are a few of many, and indicate both that a well arranged estimate book, which provides complete lists of items to be figured upon, is a time, labor and money saver, and that the *"CONTRACT AND ESTIMATE RECORD BOOKS"* come up to this requirement.

THE EDITIONS ARE AS FOLLOWS:

CONTRACT AND ESTIMATE RECORD BOOK FOR PLUMBERS

OFFICE EDITION.

200 Pages. Arranged for 100 Estimates. Size 8 x 11 inches. Cloth bound, **$1.50**

500 Pages. Arranged for 250 Estimates. Size 8 x 11 inches. Cloth bound, **$2.50**

POCKET EDITION.

200 Pages. Arranged for 50 Estimates. Size 3½ x 8 in. (oblong). Flexible cloth binding, **$0.50**

CONTRACT AND ESTIMATE RECORD BOOK FOR STEAM AND HOT WATER HEATING

200 Pages. Arranged for 100 Estimates. 7 x 12 inches. Cloth bound, **$1.50**

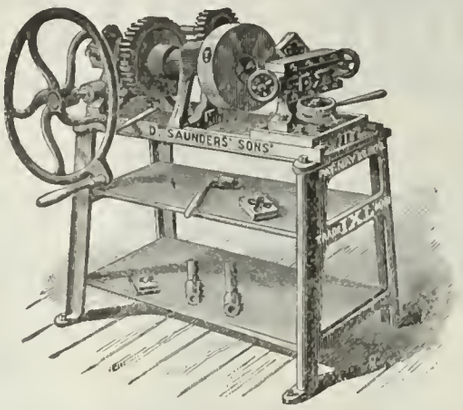
NOTE. The omission of one item in an estimate on a plumbing or heating job might result in the loss of all profit. These books provide a reliable, accurate, business-like record, and a sure means of avoiding loss due to mistakes and omissions.

Sent prepaid on receipt of price.

DAVID WILLIAMS CO.
PUBLISHERS
232-238 William Street, N. Y.

D. SAUNDERS' SONS,

MANUFACTURERS OF THE ORIGINAL



TRADE **I. X. L.** MARK



Pipe Cutting and Threading Machine.

Beware of imitations. None genuine without our Trade-Mark and Name.

STEAM AND GAS FITTERS' HAND TOOLS.

Also Patent Wheel Pipe Cutters.

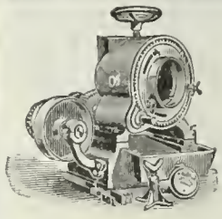
AS SHOWN BY THE CUT.

Pipe Cutting and Threading Machines for Pipe Mill Use a Specialty.

Send for Circulars.

27 Atherton St., Yonkers, N. Y.

FORBES PATENT DIE STOCK



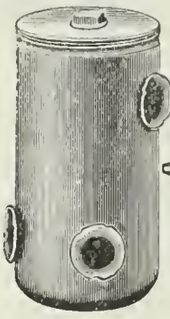
FOR HAND OR POWER.

Occupy less floor space, require less power to run, more simple of construction, far cheaper than any other machine of same range.

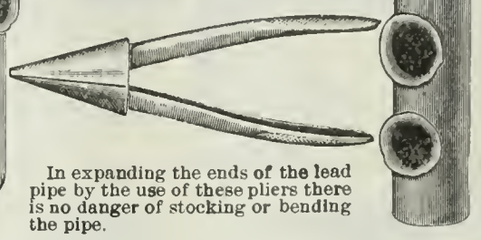
Send for illustrated Catalogue. Manufactured by

THE CURTIS & CURTIS CO., 56 Garden Street, BRIDGEPORT, CONN.

The Anderson PATENTED. Lead Pipe Expanding Pliers.



The only tool ever produced that will turn out a collar on lead traps and lead pipes.



In expanding the ends of the lead pipe by the use of these pliers there is no danger of stocking or bending the pipe.

"PLUMBER'S BEST FRIEND."

PRICE $1.25.

Send for Discount.

Sample pair sent by mail to any point in the U. S., postage paid, on receipt of price.

Manufactured by

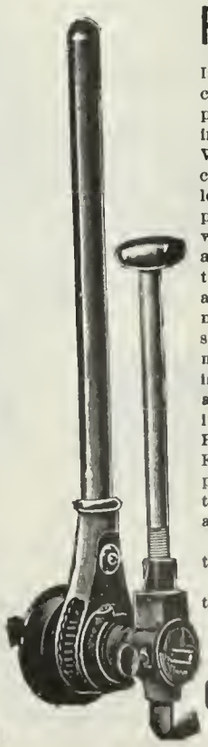
THE

Anderson Coupling Co.

PORTLAND, CONN.

The Climax

RATCHET STOCK



Is an indispensable tool for conveniently threading iron pipe in ditches, under floors, in corners, over bead, etc With this tool threads can be cut without removing whole lengths of pipe. This tool is provided with a strong vise which securely grips the pipe and by means of the leading thread the die is forced on pipe and the thread is cut. It is made of malleable iron and steel, and while light in weight, making it convenient to carry, is very strong and rigid. The advantages of this tool make it absolutely indispensable to Plumbers, Steam and Gas Pipe Fitters, Gas and Water Companies, Machinists, etc. It takes standard size dies, which are extra if furnished.

No. 1 threads ¼ to 1 in. pipe takes 2 or 2½ in. die, $10.00.

No. 2 threads 1 to 2 in. pipe takes 2½, 3 and 4 in. die, $17.00

For sale by leading jobbers

Manufactured Solely by

C. M. Kemp Mfg. Co.,
Baltimore.



Day Metallic Manufacturing Co.,

DETROIT, MICHIGAN,

Manufacturers of

Steel Enamel and Steel Clad

BATH TUBS and HEATERS.



TRIMO

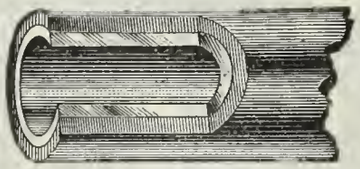
This PIPE WRENCH

Is drop forged and built for hard usage. Does not crush, slip, or lock. All parts interchangeable. Send for catalog showing complete line.

TRIMONT MFG. CO., Roxbury, Mass., U.S.A.

TIN LINED
IRON PIPE.
For Pure Water.
Avoiding without extra expense all danger of lead or brass poisoning.

L. & R. PIPE.—Patented.

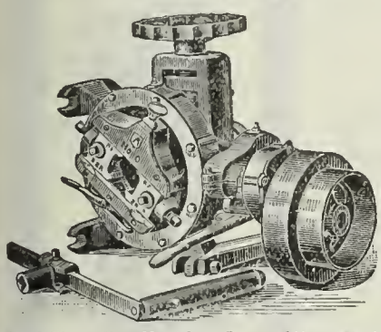


This lining cannot be torn from the pipe even by bending or by hot water.

LEAD LINED
IRON PIPE.
Made the Same Way

LAMB & RITCHIE, Cambridge, Mass.

WE BUILD A SUPERIOR LINE



of PIPE THREADING,
and CUTTING OFF
MACHINES, (Hand or Power,)
STOCKS, DIES and other Tools
For
WATER, STEAM and GAS FITTERS.
—— CATALOGUE? ——
THE ARMSTRONG MFG. CO.,
No. 0 Threading Machine, Power Attachment. 139 Centre St., New York. BRIDGEPORT, CONN.

In case of a Freeze Up



$4.50 Net.

a No. 5 Fire Pot cannot be beat. By removing a spring key the top section can be removed, exposing an open fire which may be used as a torch for thawing frozen pipes, taking soil pipe apart, or in doing any work that a torch will do, and in addition you have a complete fire pot, enabling you to heat soldering coppers and melt a kettle of metal at the same time. Our catalog tells all; it's free and is worth dollars to you.

CLAYTON & LAMBERT MFG. CO.
DETROIT, MICH., U. S. A.



PRACTICAL GAS FITTING. Describing how to run mains, lay pipes, and put up gas fixtures. This is a concise and practical manual on the best methods of doing gas fitting. 116 pages, 54 illustrations, 5¼ x 8 inches, cloth.....$1.00

STANDARD PRACTICAL PLUMBING, being an Encyclopedia for Practical Plumbers, and Guide for Architects, Builders, Gas Fitters, Hot Water Fitters, Iron Mongers, Lead Burners, Sanitary Engineers, Zinc Workers. By J. P. Davies. Numerous engravings. Volume 1, second edition, revised, royal, 8vo, cloth.....$3.00

MODERN PLUMBING STEAM AND HOT WATER HEATING. By Jas. J. Lawler. A new practical work for the Plumber, the Heating Engineer, the Architect and the Builder. Illustrated, with drawings, sketches and folding plates. 400 pages, 7½ x 10 inches, cloth $5.00

PRACTICAL HINTS ON JOINT WIPING FOR BEGINNERS IN PLUMBING. Sixth edition, enlarged; with an appendix giving a selection of practical letters and articles compiled from "The Metal Worker." 66 pages, 41 illustrations. Paper 25c

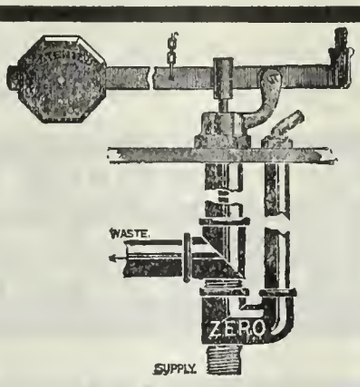
HOT WATER HEATING AND FITTING; OR, WARMING BUILDINGS BY HOT WATER. A description of modern hot water heating apparatus; the methods of their construction and the principles involved. Writen in plain style with many illustrations, diagrams and tables. By Wm. J. Baldwin. 385 pages, cloth.....$2.50

A MANUAL OF HEATING AND VENTILATION, for the use of Engineers and Architects, embracing a series of tables and formulas for dimensions of heating flow and return pipes for steam and hot water boilers, flues, &c. Second edition, revised and enlarged. By F. Schumann. 12mo, roan $1.50

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MODERN PLUMBING ILLUSTRATED. A series of fifty blue print charts. By R. M. Starbuck. Showing at a glance and in detail correctly designed or arranged Plumbing and Drainage Systems; hights at which all fixtures are set, size of all pipes, and ways of making numerous connections, with explanatory notes..... .. $3.00

Send, postpaid, on receipt of price by
DAVID WILLIAMS COMPANY,
232-238 William Street, New York



SAVE HALF

The expense of installing closets by getting

Zero Anti-Freezing Valves.

They can be put in with half the time and half the labor because they do not require a pit or vault.

They are simple and durable in construction—made without screws, springs or pins.

Zero Valve & Brass Mfg. Co.,
296 Seneca St., Buffalo, N. Y.

ALWAYS IN STOCK.

ALL SIZES OF
Galvanized range boilers, expansion tanks and boilers with copper tube coils inside for heating water by steam.
L. O. KOVEN & BROTHER,
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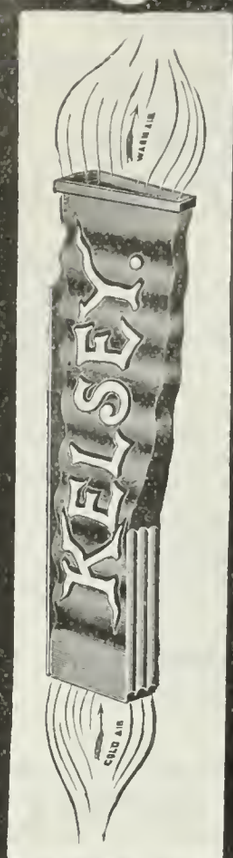
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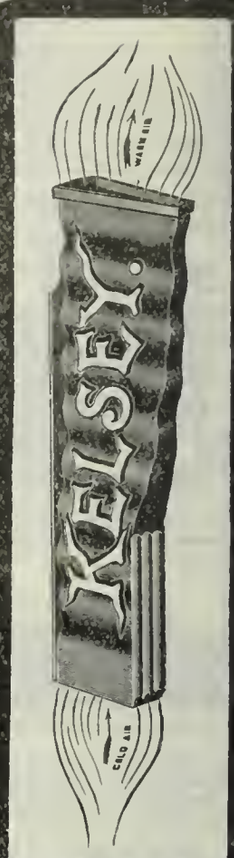
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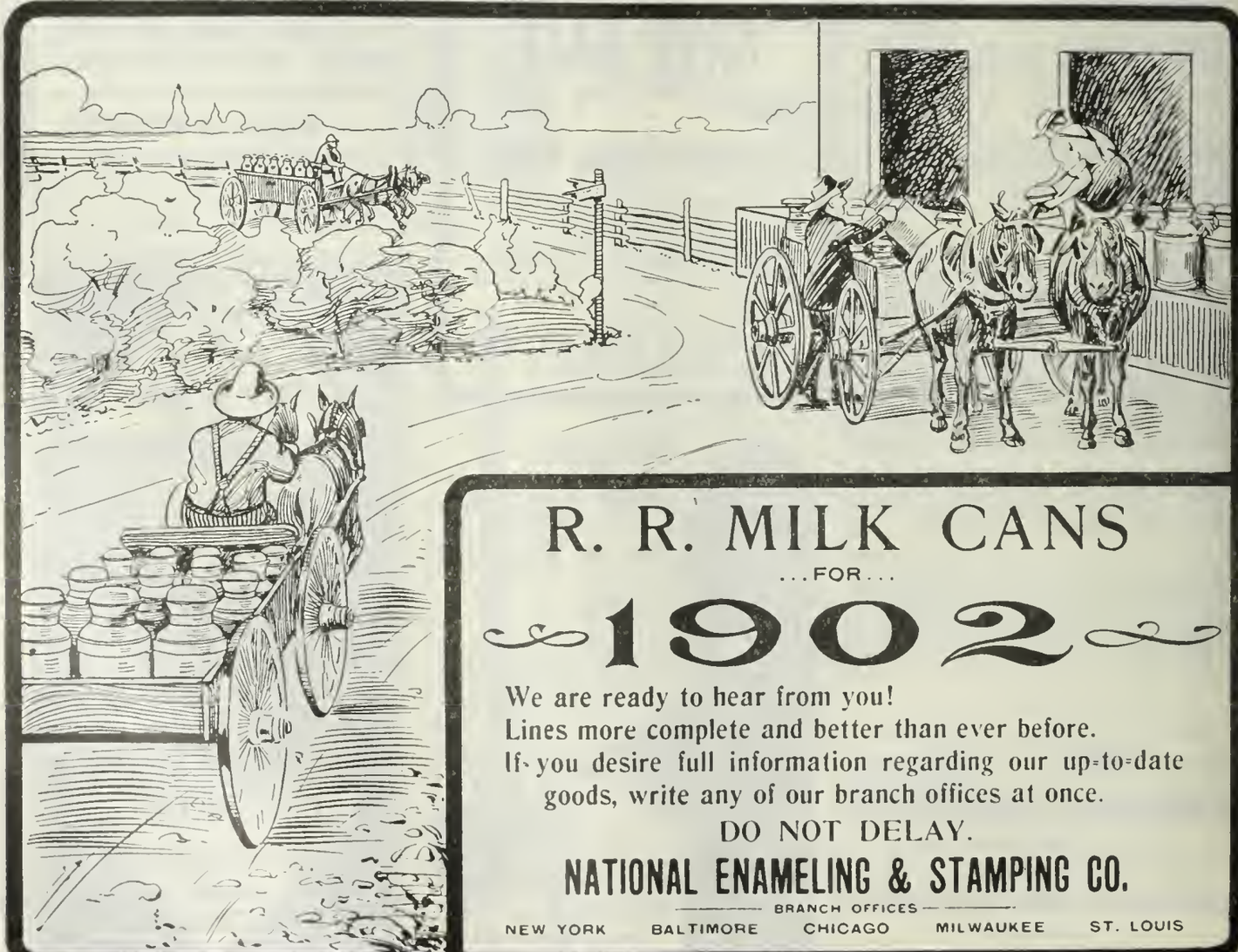
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Tunnel Ventilation.

Owing to the disastrous accident which recently occurred in the tunnel of the New York Central Railroad in New York, news of which has reached all sections of the country, wide interest will be taken in the steps taken to obviate the conditions which caused it, now that sufficient time has elapsed for an investigation of the matter. For some time both the public and the authorities have been aware that some danger attached to the use which was made of the tunnel. In the light of what has been accomplished in other tunnels and subways, there were not wanting those who persistently advocated a proper ventilation of the tunnel as a means of safety. Last spring the authorities spent some time in investigating the conditions in the tunnel with a view to alleviating them. At that time the daily papers printed much matter regarding the vitiated atmosphere through which travelers were forced to pass in entering New York. But the question of the necessity of ventilation or some means of reducing the pollution of the atmosphere in the tunnel was left unsettled. Apparently the same opposition to ventilation was presented by those who had control of the tunnel that has been offered to the introduction of ventilating systems in every field where their use has been found a pronounced benefit. Instead of recognizing the fact that whatever method of alleviation might be adopted ventilation was a necessity, those who were endeavoring to improve the conditions in the tunnel apparently were willing to take what they could get, rather than to strive for something which could only be attained by a long continued effort, and looked to the substitution of electric traction through the tunnel as a solution of the problem. What has been accomplished by means of a ventilating system in the Boston subway is a matter of record. That the work can be duplicated by ventilating engineers in the New York tunnel is merely a matter of expense. At a recent meeting of the American Society of Heating and Ventilating Engineers a special committee, composed of experts, reported that their services had been offered to the authorities last spring, with the view of aiding in devising some system of ventilation. But, notwithstanding that the services of these experts were available, the question of ventilation was set aside for the time. It is to be hoped that whatever changes may now be adopted to insure the safe transport of passengers, they will be accompanied by a system of ventilation that will prevent passengers being forced to pass through a vile atmosphere, as has been the case heretofore, and which could be entirely obviated if the matter of ventilation was placed in the hands of any one of the many capable ventilating engineers available.

The Dynamite Disaster.

Deplorable as was the disaster attending the explosion of dynamite in the new subway in course of construction in New York, on Monday last, there will be some compensation if investigation of the cause leads to prevention of the illegal use of large charges of dynamite in connection with construction work in the city. For a number of years the rights of a large number of property holders have been violated by almost every man who had a contract for blasting out the cellar for some small new building. By the use of large charges of dynamite in blasting away the rocks, he has been able to complete his work quickly and at a comparatively small expense. The use of these large charges has shaken buildings for blocks around the point of his operations, causing the settling of walls, cracking of ceilings and cornices and, not infrequently, jarring the plumbing systems in buildings so as to cause cracks in cast iron soil pipes and water closet connections, that offered free entrance to the foul air from the drainage system, with all of its insidious influences. It seems a step backward when, for purely mercenary reasons, a contractor or a contracting corporation is allowed to come into the midst of a large city and use blasting charges which are a menace to the rights of all the surrounding property owners, to say nothing of the safety of citizens passing in the streets. Not a few accidents have occurred from the *débris* hurled by these blasting charges doing injury to persons who were taking due care to avoid accident and who suffered from the neglect of the city authorities to protect their rights. Had the complaints of those who were obliged to put up new ceilings and cornices or repair their plumbing systems received the attention that was their due the citizens would have been saved much expense, trouble and inconvenience. However desirable the saving of time by the use of high explosives for blasting purposes may be in the completing of large public work, it should not be necessary for such disasters as that which caused terrible injury and loss of life and the wreckage of many buildings in New York last Monday to induce action to protect public interests from the storage of large quantities of dynamite in exposed positions and the use of dynamite charges of illegal size.

Successful Arbitration.

The Arbitration Committee of the National Civic Federation already have the adjustment of one important labor dispute to their credit. By bringing together the president of the National Association of Clothing Manufacturers and the general secretary of the United Garment Workers of America, they have succeeded in healing a breach that has been open for the past year and have thereby averted a threatened strike of about 40,000 workers in the clothing industry. Through the intervention of the committee a satisfactory basis of compromise between the two interests was agreed upon.

One of the questions in dispute was the claim of the garment workers for an eight-hour working day, in place of the nine-hour day insisted upon by the employers. The two parties have been induced to meet each other half way and compromise on an eight and a half hour day. The value of the Arbitration Committee was fully illustrated in this instance. In the dispute in question each side was obstinately set upon the maintenance of its claims, but when brought together it was quickly found that the interests of each could be best served by a mutual compromise. It is understood that a meeting of the Arbitration Committee of the National Civic Federation will take place in New York City on February 19, when a definite plan of action regarding the arbitration of labor disputes will be submitted for adoption. In this connection it is gratifying to note that every one of the thirty-six distinguished men who were appointed on the committee at the meeting of the Civic Federation in New York early in December has agreed to serve.

Making Plans.

For a number of years it has been a part of the agreement which has produced the harmonious relations between the manufacturers of house heating boilers and the members of the National Association of Master Steam and Hot Water Fitters that, as far as possible, the manufacturers would refrain from making plans for the assistance of customers, except those who have already secured the contract for work. This feature of the agreement has been observed to such an extent that no serious complaints of violations have arisen. The report is now made, however, that a supply house in the Central West plainly state in a circular letter to the trade that, with a view to extending their business, they will make plans and specifications for all customers who place orders with them. This has caused the steam fitters to file a complaint against this practice, which is claimed to be productive of no good. It is urged that competent men in this line of trade are better able, through being on the spot, to calculate the cost of a given piece of work than men at a distance, who have nothing but the plans to guide them. In consequence they are often drawn into unfair competition, and must either lose a job or take it at lower figures than good business judgment would dictate as advisable. It is also pointed out that in some instances salesmen who are eager to make sales of apparatus are led to make plans and specifications and to estimate on work for prospective customers, making prices much lower than those at which the work could profitably be done. This practice not only works hardship to the whole trade by lowering the value of their work, but also loss to the contractor who has accepted work on the salesman's figures. There can be no doubt that while the members of the steam fitting trade are endeavoring to protect their own interests, there is good, sound business sense in the argument which they present. In view of the arguments presented it is thought improbable that the departure of the concern referred to from the course that heretofore has met general approval will be widely followed.

The Paris correspondent of the *Engineering and Mining Journal* informs the readers of that periodical that "The active campaign against the use of white lead as a pigment is gradually being developed. It is claimed that white lead poisons the painters who use it, and that it is injurious—though in much less degree—to those who live in dwellings painted with this material. Zinc white, it is said, is a material entirely free from these dangers and should be substituted for the lead."

The Exports of 1901.

The export record of the United States in the calendar year 1901 is very satisfactory, when its total is compared with that of 1900 or of any preceding year. While the apparent total falls about $12,000,000 below the figures of 1900, the fact that the export figures of 1901 do not contain any of the shipments from the United States to Porto Rico or Hawaii, which aggregated probably $30,000,000, shows that the grand total of shipments formerly classed as exports to foreign countries was in the year 1901 greater than in any preceding year. While there was a reduction of $100,000,000 in the value of exports of certain great articles, notably corn, copper, cotton and iron and steel, there was a sufficient increase in other articles, notably wheat, flour, provisions and cotton manufactures, to practically offset this reduction. The reduction in exports of corn, as is well known, was due solely to the great shortage in the corn crop, the total figures of exports for the year being but $50,361,388, against $84,284,733 in 1900, a reduction in round terms of $34,000,000. In cotton, while there was an increase of 155,000,000 pounds in the exportations, there was a decrease of $13.000,000 in value. Of copper, the value of exportations in 1901 was $33,534,899, against $57,542,610 in 1900, the decrease in quantity being proportionately about the same as that in value. In iron and steel there was a reduction of $27,000,000, the export figures for 1901 being $102,539,797 and in 1900 $129,633,480. This reduction in iron and steel exports was partly due to reduced prices and partly to a decrease in the quantities exported. In locomotives the number exported showed an actual increase, while the value showed a decrease of about $400,000. In various other manufactures of iron and steel the reduction in values was proportionately greater than the reduction in quantity, but there were material reductions in quantity in certain articles, such as bars and rods, steel rails, wire nails and steel sheets. Another indication that the reduction in the value of exports is due quite as much to a fall in prices as in quantity is found in the fact that while the quantity of refined mineral oil exported showed an increase of nearly 100,000,000 gallons, the value showed a decrease of about $1,000,000. The aggregate of practically $100,000,000 reduction in the exports of the five articles named is nearly offset by the increase in exports of wheat, provisions, live animals and cotton manufactures, cotton seed oil and oil cake, and leather and manufactures thereof. Add to this the further fact that the shipments to Hawaii and Porto Rico aggregated probably fully $30,000,000, and the record of 1901 will compare favorably with that of any preceding year.

To Cool the Air at the St. Louis Fair.

It is proposed to try an interesting experiment in the way of cooling the air at the international exposition to be held next year in St. Louis. The idea is to reduce the high temperature of the grounds during the summer months by drawing downward cool currents from an altitude of 800 to 1000 feet above the ground and distributing over the fair grounds air from 10 to 15 degrees cooler than the surface temperature. The plan, according to a published description, comprehends the construction of an aerial tower or stand pipe of the aforesaid hight, with lower termination about 50 feet above the ground, where large fans or blowers are attached that will draw a current downward at the rate of 20 or 30 miles an hour, equivalent to a pumping capacity of 500,000 cubic feet of air per minute. This volume of air will cover an acre 10 feet deep—in an hour 60 acres and in six hours 360 acres. It is expected that calefaction through the action of the sun's rays will be counterbalanced and neutralized by the constancy of the current during the daytime. After sundown the temperature, it is claimed, can be held below 80 degrees F. The fans are to be started at 4 a.m., when the air is coolest. By 10 o'clock the buildings and grounds would be filled with fresh air and so maintained during the day.

How to Plan a Warm Air Heating System.

BY C. E. OLDACRE.

The article published in *The Metal Worker* of December 28, 1901, under the title, "Some Hard Knots in Furnace Practice," is worthy of the careful perusal and thoughtful attention of every one interested in the furnace trade, be he engaged in the sale or the erection of furnaces. I have read it over several times, and each time something new has impressed me.

Possibly one can be entirely too verbose in the expression of ideas, but in this article, the writer, from the experience he has had, surely could have given expression to many more good thoughts and ideas, and related more impressions that he has gathered from various sources, with beneficial results to the heating fraternity.

The article in question is thought boiled down and would stand much elaboration that would be of great value to every one in the trade.

Quoting from the article, the writer says: "To start with, the furnaceman must ascend to the point of understanding that there are several fixed and unalterable laws governing the case." Furnacemen, here is one of the keynotes to success in our work. In fact, the keynote of success. There are no mysteries (strictly speaking) in furnace work. It is all cause and effect; the following of some immutable law of nature. The more we study these causes and effects, the more readily we can apply them in a general way to all our work.

OBSERVE AND RECORD.

Every furnaceman will recognize the fact that no two jobs are precisely alike in every detail. This being the case, it becomes all the more necessary for each and every one of us who may be endeavoring to produce the very best results from our work to thoroughly and clearly understand these causes and effects so far as possible and to have certain rules worked out and laid down that are gathered from our own and others' experience and study for our further guidance.

The further we get from the guess and the "cut and try" methods the nearer we will be to success. The chemist, when he desires to produce a certain known chemical, goes about his work in an absolutely methodical manner, using his various quantities in absolute proportions determined by weights and measures. He does not throw in a handful of this and some of that and some of this by guess and await possible developments. He experiments, of course, devising new combinations and new and possibly shorter and quicker methods, but not on the goods which he already has in the process of manufacture or is regularly manufacturing. Why should it not be so with us?

Take at random a dozen jobs that you have done in the last year and study the plan of each in all its detail. See, as nearly as possible, why some have been entirely successful and some only partially so. Study them all through, and if you will apply what you have learned to any that have not been all you might have wished them to be, I have no doubt but that you will see the means of remedying any such shortcomings.

CAUSES OF FAILURE.

After investigation of hundreds of heating plants, running well up into the thousands, I assign the following as the principal causes of many failures in hot air heating that have occurred in the past—but not occurring so frequently as we more closely study and clearly understand our various undertakings:

Furnace too small.
Furnace improperly located.
Draft not sufficient.
Cellar pipes not properly arranged.
Cellar pipes not properly proportioned.
Cellar pipes too small.
Some cellar pipes too large.
Insufficient pitch to cellar pipes.
Friction from the use of two-piece elbows.
Too much friction in various fittings used.
Failure to use fittings that provide easy turns.
Too much friction at bottom of stack or flue.
Lack of protection to cellar pipes when subject to currents of cold air.
Lack of fresh air duct.
Insufficient size of fresh air duct.
Lack of means for adjusting fresh air duct.
Fresh air duct taken from wrong side of house.
Fresh air duct taken from a point affected by adverse air currents.
Fresh air ducts closed entirely by slides.
Fresh air ducts wrongly connected to furnace.
Improper arrangement of return duct, where used in connection with fresh air duct.
Screen of too small mesh used over fresh air inlet.
Heat flues too small.
Heat flues improperly located.
Heat flues not proportioned to their work.
Heat flues not protected in outside walls.
Heat flues not protected at other cold points.
Heat flues diminished in size at various joints of stack.
Heat flues diminished in size in changing shape of same.
Heat flues diminished in size by register body projecting too far into flue.
Heat flues diminished by too small dampers.
Too many heat outlets on one stack.
Registers too small.
Register not of proper shape.
Register of too close pattern.
Lack of ventilation.
Too much cold air entering through loose fitting doors and windows.

CARELESS WORKMANSHIP.

Any one of the above is sure to cause trouble in one way or another, and all are to be studiously avoided. Look after last closely, and you may have time to look after the others.

From my experience of a number of years in laying out and in the erection of hundreds of heating jobs and from the personal investigation of many more, involving the placing of apparatus in houses ranging from 6 to 40 rooms, and where the pipes have varied in length from 3 to 70 feet and averaged in length from 10 to 30 feet, and in houses having from 10,000 to 175,000 cubic feet contents, I believe most any defect or failure of a hot air heating plant can be easily traced to one or more of the causes mentioned.

THE WEAK POINTS OF RULES.

I have seen quite a number of empirical formulas worked out by different men, and have looked into various "rules of thumb" for the proportioning of the heat pipes, but in all of them it has seemed to me that there has always occurred the omission of three very important factors that should enter into any calculation on the subject. These factors are: 1, The pitch or rise of the pipe from the heater to its outlet; 2, the length of the pipe in the cellar; 3, the friction due to angles and to transition pieces.

THE EFFECT OF PITCH.

The more decided is the pitch or rise of the pipe the greater is the ease with which the air will flow through the pipe and consequently the greater will be the volume of air for same proportionate size of pipe. The relation of the pitch of the pipes to one another should also be considered. The pitch of each pipe should enter into all calculations as much as any other factor.

The trade has been told that no cellar pipe should be over 15 feet long, and if longer ones were used it was risky. From my experience I cannot agree with such statements. Given a furnace of ample capacity for the work and no such limitation should be placed. Two or three times that length can be easily used if the pipe is properly proportioned to the work. In my work there are few cases where there are not one or more pipes of such lengths, and pipes that lead to important rooms where to meet the requirements 70 degrees must be maintained in zero weather.

FACTORS FOR CONSIDERATION.

In placing such pipes there are many factors that must be taken into account, such as the size of the room;

whether it is on the first, second, third or fourth floor; whether it is on the north, south, east or west side of the house; what is the extent of exposed wall surface and the character thereof; the amount of glass surface; the length of pipe; the pitch of the pipe in the cellar; the number of bends and points of resistance; the shape of the flue in the partition or wall; the loss of heat due to the cooling of the air in passing from the heater to the outlet; all of which are questions involved in determining the number of cubic feet of air brought into the room in a unit of time and the temperature of the entering air, &c.

RESISTANCE FOR HOT AIR CURRENTS.

I note in the article in *The Metal Worker* above referred to the following sentences: "Then what resistance does hot air meet with in a horizontal pipe? Presumably its own friction in passing through the pipe, irrespective of the direction in which the pipe is run. The resistance is encountered at the register box where it enters the cold room, and nowhere else." (The italics are my own.) To this I dissent, if I correctly construe the statements as given.

The velocity of the air in the pipe depends (not entirely, however), on the difference between the temperature of the air at its outlet and the external air, which, for the purpose of all calculations, is generally assumed to be at zero. If the pipe is subjected to cooling at any point or at various points from the heater to its outlet the velocity is consequently reduced. This affords a good reason for thoroughly protecting all pipes and tin heat flues with asbestos. The use of liberal quantities of this article will pay handsomely in the better results thereby gained. Again, the friction is greatly controlled by the size of the pipe, its shape, its length, its pitch and the character of angles or bends used throughout the run of the pipe to its outlet.

FRICTION FROM THIN FLUES.

The smaller the flue, the flatter it is, the longer it is and the sharper the angles or bends, the greater is the friction and the lower is the velocity. Is it not a mistake to speak only of the resistance to the flow of the air in the horizontal pipe? I assume that it is. The resistance with which it meets throughout the entire line from the heater to where it enters the room to be heated should be considered, and the cooling to which it is subjected throughout this line should also be taken into consideration. The well-known axiom will readily apply here, "The strength of anything is equal to its strength at its weakest point." Of course I do not mean to say that the register cannot be wrongly located, as the current of warm air can and may be still further subjected to other resistances and untoward influences.

THE EFFECT OF VELOCITY ON RAISING TEMPERATURE.

The question of the raising of temperature of the air within any room to a comfortable temperature, say 70 degrees F., when the outside temperature is below this point, depends upon the number of heat units brought into the room in a unit of time. In hot air heating we have to do this by bringing in a certain number of cubic feet of air carrying a certain number of heat units per cubic foot, or, in other words, having a flue of a given size, to maintain a certain velocity in this flue and to have the air of a certain temperature. Nothing more and nothing less. There are no further mysteries about the matter. The lower the temperature the lower is the velocity. The lower the velocity the lower is the number of cubic feet of warm air brought in through a flue of any given size. The lower the number of cubic feet of warm air the lower is the number of heat units conveyed to the space to be heated.

VELOCITY AND HEAT UNITS CARRIED BY AIR AT DIFFERENT TEMPERATURES.

For instance, it has been calculated that the velocity attained by a column of air 5 feet high at a temperature of 100 degrees F. in excess of the outside air is 240 feet per minute, whereas at an excess of 50 degrees F. it is only 165 feet per minute. Allowance here for friction and lower temperature is 50 per cent. That is, the velocity is reduced over 30 per cent., due to this drop or difference as stated in the two cases. Also, if the incoming air is brought in at 140 degrees F., each cubic foot will carry with it 2.2 heat units; if at 120 degrees F., 1.9 heat units; if at 100 degrees, 1.7 heat units, and if at 90 degrees, 1.5 heat units. But as the air escapes from the room at 70 degrees F. no part of heat contained in the air at 70 degrees can be used for the heating of the room; so at 140 degrees only 1.1 heat units can be utilized to counteract the losses through transmission.

DETERMINING THE SIZE OF PIPES.

Not any one size pipe will answer for the same number of cubic feet of contents in a room under any and all conditions. The nature of the exposure, the character of the walls, the square feet of exposed wall surface, the square feet of glass surface, the approximate changes of air per hour due to leakage and to ventilation through fire place chimneys or other means of ventilation, the velocity of incoming air and its temperature, as before spoken of, all must enter into any calculations we may desire to make as to size of the pipe required. Before the successful application of any rules or formulas for the size of heat pipes is made due consideration must first be given to all these controlling factors. Without it we might as well go back to guess work and take our chances for success or failure in our work.

We all have different ways of doing our work, and pursue different methods. Any rule without the coefficients stated for the various conditions met with in our work cannot be properly and correctly applied. But the coefficients for all these can be worked out, and, where rightly applied, are sure to bring about successful work.

Where is there a calling or business that affords more opportunity for the pleasant study of its various details than the heating business? I for one know of none, and the interchange of ideas that is afforded us through *The Metal Worker* cannot be otherwise than beneficial.

PIPES THAT ARE ROBBED OR HAVE REVERSE CURRENTS.

The last paragraph of the article referred to in *The Metal Worker* is quite interesting. The condition spoken of when one pipe takes all the heat and another is bringing down cold air has been observed by the writer. It can nearly always be accounted for by too small a furnace, too small or no cold air duct, cold air duct closed off entirely, or nearly so; too large a pipe in the one case and not large enough in the other, or more cold air by far coming into the room having the cold pipe than there should be from loose fitting doors or windows. The first two reasons given cover the matter in nearly all cases.

Only a few days ago the writer, in examining a job where there was a large brick set heater, removed a floor register that was directly over the main drum or body of the furnace, so that the top of the furnace could be seen. The entire body was red hot, yet there was not one particle of hot air coming from the flue. This register was located in a hall opening to the west. There were six other flues leading to rooms on upper floors, and all close to the heater. I found the fresh air duct closed off completely and any quantity of cold air coming in under a loose fitting door which was not more than 6 feet from the register. As soon as these conditions were reversed there was at once an ample flow of heat to the register, where before cold air was entering. As no cold air was coming in through the fresh air duct, and as air would be moved by the very hot surfaces if it was to be had from any point at all, it was very naturally taken in at the lowest outlet and from the coldest point, as that air would most easily fall and displace the heated air that was lighter and which had ample opportunity to seek higher levels.

DETERMINING THE SIZE OF FURNACE FOR USE.

Referring to the causes enumerated for failures in hot air heating apparatus, the first cause named—furnaces too small— will account for about as large a number of failures as any. In fact, I think I would be justified in saying that it is the cause of more failures than any two other causes named. The question of the size of heater to be used should be reckoned from the area of the grate in square feet or square inches and not by the casing size.

The amount of grate surface provided should bear a relation to the exposed wall surface and glass surface more than in relation to the cubic contents. The importance of this can be readily seen where a greater number of cubic feet of space can be heated in a church than in a private house, as in the first case we have a very much smaller amount of exposed wall surface for the cubic contents than in the second. A closer and more accurate way is the relation of the grate surface to the equivalent glass surface (E. G. S.). This is easily obtained by measuring the entire amount of outside wall surface in square feet and then subtracting from the amount obtained the square feet of glass in all walls and dividing the remainder by 4 (assuming that 1 square foot of glass cools as much air as 4 square feet of exposed wall), and then adding this quotient to the glass surface, which will give the equivalent glass surface (E. G. S.). If the house in question is one of a block, or a double house, add one-half of the party wall and count as exposed wall surface.

GRATE SURFACE AND EQUIVALENT GLASS SURFACE.

Taking good, first-class heaters of average construction, it will be found to be safe practice to allow 250 square feet E. G. S. per square foot of grate surface if 70 degrees F. is to be maintained with zero outside. Small heaters, owing to their greater ratio of heating surface to grate surface, will accomplish more than that, but as the larger ones usually receive more attention no allowance is made for this.

Some heaters will not accomplish this much except at a high rate of combustion of the fuel, while some will do more, owing to their having a larger amount of surface or on account of more effective surfaces. The latter ones can be relied on to accomplish the same work at a lower rate of combustion and a consequent saving of fuel.

AMPLE FURNACES INSURE ECONOMY.

I know some furnacemen will say that this provides a much larger heater than is necessary, in their estimation, but it is based on the idea of continuously and simultaneously heating all spaces as divided up in private houses to an average temperature of 70 degrees F. in zero weather, with a rate of combustion not to exceed 5 pounds of anthracite coal per square foot of grate surface. If a higher rate of combustion (which cannot be recommended) is determined on, or if a higher outside temperature is figured on, or if lower temperatures are to be maintained in all or part of the house, or if the heat is shunted or turned from one part to another as the apartments are used, as is often the case, then, of course, a smaller heater may meet the requirements.

THE EFFECT OF POOR CHIMNEYS.

There is nothing in the field of the heating business that can come nearer upsetting all one's calculations than a poor draft, that may come from any number of causes, but usually from chimneys of too small size. No matter how good the heater or how well laid out the work, or how well it may be executed, if the fire does not burn properly no good results can be expected. No chimney for a heater should be less than 8 x 12 inches throughout its whole length, and it should be carried up free of all roofs or other obstructing objects. It should also have no other openings in it than the ones for the smoke pipe from the heater and the clean out door below where the smoke pipe enters. As the furnaceman does not, as a rule, build the chimney, he should act only in an advisory way as regards the chimney and assume no risk for the draft, distinctly stating that he is not to be held responsible for the character of the same. Many good heaters have undoubtedly been condemned for no other reason than poor drafts.

THE FRESH AIR SUPPLY SHOULD BE AMPLE.

The fresh air duct should receive proper attention. It should be large enough to supply all the pipes at one time. It is an invariable rule that what is not put into a thing cannot be got out of it. In order to have all the pipes leading from the heater perform their allotted share of the work the duct must be made large enough to supply the required amount of air. It is the practice to allow all the way from one-half to the full area of all the pipes taken from the heater, but for a number of reasons I favor having the full area in most cases. If the supply of air is not sufficient then the pipes are sure to act very erratically and the distribution of the heat will not be certain and equal. The life of the heater will be very much shortened and the cellar will be unduly heated if there is not an ample supply of air.

The duct should be provided with a damper or valve, so arranged that the entire supply of air cannot be cut off at any time, but so that it can be reduced in size or effective area, as may be needed, during the time of high winds. If the entire supply is allowed to be cut off by the damper or slide it will be as bad as no fresh air duct, and, in fact, worse. You need not expect to see the rooms on the lower floors or on the windward side properly heated under this condition. A duct the full size of the pipes will be found best, as it will provide a full supply of air at all times and prevent any overheating that might take place at certain times.

Ducts built of galvanized iron are to be preferred, as they are sure to be tight and can be made much neater and occupy much less space than if made of wood. They, of course, cost a trifle more, but are worth more than the difference. Where underground ducts are used they should have walls of brick laid in cement and a brick or flagstone top, the same cemented over, and they should have a cement bottom. Underground ducts are to be avoided if there is any possibility of water getting into them.

The window frame to which the duct is attached should afford a free opening as large as the duct, and this after allowance is made for any bars or screens that may be over the opening. It is well not to use galvanized iron wire or other netting having less than a ½-inch mesh.

RETURN AIR DUCTS.

Return fresh air ducts are not to be commended, except that possibly they do save some fuel or permit of heating a larger space with a given sized heater than would be the case if the air was taken wholly from the outside. There are many more good reasons for not using them in first-class work than there are reasons in their favor. They are unsanitary, to say the least, and nullify one of the best arguments in favor of warm air heating—the constant supply of pure air. They are liable to cause trouble, require extreme care in their management and are not to be depended on, as a rule. They interfere with ventilation, and if there should be any sickness in the house the air from wherever it may come is taken down into the heater and again distributed to any and all points. As they convey the air through register faces and valves—either automatic gossamer valves or hand-actuated valves—good lodging places are afforded for microbes and germs of all kinds. Any saving in fuel is undoubtedly at the cost of health and the risk of possible protracted sickness. Return ducts are not necessary adjuncts of heating work, and were surely never intended for any purpose other than to increase the capacity of an otherwise inadequate heater. Plenty of pure air, with the health and comfort accruing therefrom, is more to be prized than the few dollars saved in fuel.

PUSH HIGH GRADE WORK.

First-class heating work costs more money to install than just putting in a heater in any kind of way. It should, and does, command a better price. It cannot be done in competition, on a price basis, with slipshod work, and no attempt should be made by any one to so compete. There is a fine field ahead for first-class warm air heating, and with the reputation of doing such work you should under no circumstances put your work on a par with the poorer class of work, of which there are plenty of examples extant. More and better materials are required for the better grade of work; larger heaters than are usually calculated on must be used, and the work requires more personal attention and supervision. Thus the service rendered to the customer should warrant a higher rate of compensation.

The Late Otto Germer, Sr.

The sudden death of Otto Germer, Sr., of the well-known stove manufacturing firm of Black & Germer of Erie, Pa., at the age of 68 years, which was briefly referred to in our issue of last week, called forth universal expressions of regret among a wide circle of business associates and friends Mr. Germer was one of the foremost and most enterprising citizens of Erie, and was held in high regard by all classes of the community. His connection with the city of Erie began in the early sixties. With his father he came from Germany, the land of his birth, and settled in Chicago. Later he removed with his family to Erie, where he married Miss Teresa Ebisch. After spending a few years in business in Tennessee, Mr. Germer returned to Erie at the time that the oil excitement was at its highest point. As a representative of the Jarecki Mfg. Company, he went to Titusville, Pa., and sold oil tools, at the same time investing judiciously in oil property. Gradually Mr. Germer extended his operations, and at the time of his death was very largely interested in the oil industry in Pennsylvania, West Virginia and Kentucky. Leaving Titusville many years ago he returned to Erie and engaged in the stove manufacturing business as a member of the firm of Black, Germer & Johnson. On the death of Mr. Johnson his partners purchased his interest and continued the business, subsequently establishing the big East Side factory, the products of which, the Radiant Home stoves and ranges, have acquired a national reputation. By his energy and business enterprise Mr. Germer accumulated a considerable fortune. In his social life he was the center of a large circle of friends, and was especially prominent in the German society of the city. He was also a leader in local Democratic politics. Mr. Germer was a member of St. Paul's German Evangelical Church and his contributions to religious and charitable objects were liberal. In addition to his wife, Mr. Germer leaves two sons, Edward and Otto Germer, Jr., and one daughter.

Faultless Steel Ranges and Cooks.

The Faultless Mfg. Company, 617 to 621 Austin avenue, Chicago, have issued a handsomely illustrated folder setting forth the special features of their Faultless line of steel ranges and cooks. The illustrations show the ranges and cooks in a variety of styles. The company state that the ovens used in these ranges are exceptionally large. They are so arranged that a No. 9 top can be had on any size. The steel cook stoves, as well as the ranges, have the tops, oven door frames and all other parts intended to stand a heavy strain made of malleable iron instead of gray iron. In all these constructions a wood extension to the fire box is not required. They will take in a 22½-inch stick of wood. The water in the incased copper reservoir is heated by contact, there being no reservoir damper. The heat, therefore, at all times is allowed to pass unobstructed around the oven, and, radiating down the flue, heats the water in the reservoir. The oven steel is riveted to the malleable iron oven door frames, making an absolutely air tight oven, which will not allow heat to escape nor cold air to enter. The company claim that their oven will never warp, buckle or fire crack. A pouch feed with end draft is furnished on all Faultless ranges and cooks. They are also arranged so that a water front can be had to fit the pouch, which is a new feature. The company have had long experience both in building and selling stoves, and consequently are not simply experimenting in bringing out this line of goods.

The Michigan Stove Company are favoring the trade with a series of folders, having one side beautifully lithographed in colors and the other side devoted to illustrations of their specialties. The engravings in colors give interesting illustrations of child life. The specimens which have just been issued treat of the Peerless-Garland, a base heating surface burner; the Oak-Garland, which is claimed to be the emperor of oak Stoves; the new Empire-Garland Steel Range, adapted to soft coal, natural gas or wood; the Sunlight-Garland, a medium priced base burner for anthracite coal, constructed of sheet steel and cast iron, and the Fireside-Garland, intended for wood only, which is a new departure in wood burning Heaters.

Death of Christopher Emrich.

Christopher Emrich, a pioneer stove manufacturer of Columbus, Ohio, died on January 18 at his home in that city, after a protracted illness from a complication of diseases, at the age of 74 years. Mr. Emrich was born in the Palatinate of Bavaria, and came to this country with his parents when a boy of 12, settling in Columbus. After completing his education he was apprenticed to learn the molders' trade at the foundry of Gill & McCune. He remained with the firm for 20 years, and in 1861 began as a manufacturer of stoves on his own account, at the corner of Livingston avenue and Scioto street, Columbus, where his foundry is still located. He had thus been in the stove manufacturing business for 41 years, and was one of the oldest manufacturers in continuous business in Central Ohio. Mr. Emrich stood high in the estimation of his fellow citizens and the trade at large. The funeral took place on January 21, at the South Congregational Church, Columbus. His widow and four children survive him. His only son, John G. Emrich, who has been the superintendent of his father's stove plant, will continue the business without interruption, maintaining the high standard of the Florence stoves and ranges established by the deceased manufacturer.

Building a New Plant.

A letter from the H. Wetter Mfg. Company, Memphis, Tenn., states that their entire plant was destroyed by fire on January 19. The total loss amounted to $250,000, which is covered by insurance amounting to $235,000. The company, however, have made arrangements for a factory in which they can turn out a large quantity of steel ranges and steel cook stoves within the next 30 days, and they expect to be making a full line of steel and cast stoves and ranges within the next five months. In the meantime, they state that their branch houses, located at Louisville, Ky., and St. Joseph, Mo., are equipped with a very good stock, and all their rush orders are being shipped to those branches. The company have arranged to erect an entirely new plant, which will be strictly up to date in every respect, alike in the character of the buildings and in their arrangement and equipment. This plant will be about the same size as the one which was destroyed by fire, and will occupy about a space of one block.

The Kelsey Heating Company.

The successful business that has been built up in the manufacture of the Kelsey warm air generator will in future be conducted by the Kelsey Heating Company, who succeed the old Kelsey Furnace Company, at Syracuse, N. Y. Practically no change, except in the name, has been made in the business or the management, and old customers and the trade generally will receive the same generous treatment that has always made trade with this house a pleasure. New energy will be devoted to the Kelsey generator, with a view to extending its sale, by bringing attention to the many excellent features of this special form of construction. Two points will suffice to interest warm air heating contractors in a closer investigation of its merit. They are the long fire travel and the large amount of hot surface, and its arrangement to utilize the full effect of the fire and to bring all the air passing through the generator in contact with the surface. The company inform us that the Kelsey warm air generators have been selected for warming the Second Reformed and the new Tabernacle Baptist churches in Syracuse, and that three generators will be used in the new Trinity M. E. Church at Oswego, N. Y. The company's New York office is at 239 Water street, under the management of L. V. Sanford.

ODD PLATES.

The Alexander Furnace & Mfg. Company, Lansing, Mich., are favoring the trade with an exceedingly artistic wall calendar. A duck shooting scene is shown in colors. The card on which this is mounted is of a deep red, while the leaves for the months are of a lighter tint.

The Keith Furnace Company, Des Moines, Iowa, are distributing a fine large wall calendar, poster style, bound in brass at the top and bottom. It gives illustrations of the company's Monitor Furnaces. Leaves for the months, having very large figures, are attached to the bottom of the hanger.

The Columbus Stove Company of Columbus, Ohio, have been incorporated, by J. W. Hastings, F. B. Everett, J. C. Campbell, S. F. Jones and G. A. Willing, with a capital of $50,000.

T. J. Gibson & Co., Holyoke, Mass., have the contract for roofing the factory of the Hampden Glazed Paper & Card Company. The firm are also roofing two blocks which John St. John is building in Holyoke.

Ed. Q. Smith, representative of the Buckwalter Stove Company of Royersford, Pa., who makes his headquarters at Easton, Pa., announces his visits among the trade by means of special envelopes of red paper. Prominent on some is the capital letter "S," heading the words "Smith Sells Stoves." On the reverse side of one of these envelopes is the trade-mark of the Buckwalter Stove Company, and a large "S" arranged in the text, "When you think of Stoves, think of Smith and the kind of Stoves he sells."

The Pittsburgh Stove & Range Company of Pittsburgh, Pa., are sending to the Furnace trade a card well calculated to attract attention to their new Etna Furnace. Those interested in Furnace heating will be glad to secure this card, which bears a picture of two dogs, and are likely, further, to ask for a catalogue of this new production in the Furnace line of the company.

The Stanton Heater Company, Martin's Ferry, Ohio, report that they are more busily engaged than usual at this time of the year, and their outlook for the future promises even better for the sale of the Stanton Hot Air Furnace than heretofore, now that it has had an opportunity to demonstrate its efficiency.

F. W. Stelling, Hartford, Conn., will do the tinning in connection with the changes in the cold storage building of the Hartford Cold Storage Company.

The new Gas Range, Superb Fire King, which is being introduced to the trade by A. Weiskittel & Son of Baltimore, Md., is proving very popular, and the manufacturers report for it a large sale. One of its important features is an improved white enameled top which can be readily thrown back for the purpose of cleaning it, as well as the burners. The concern are also bringing out a new line of hot plates constructed with lift out burners and hinged rings, which are referred to as something of a novelty in this line.

C. D. Rounds, who represents the Abram Cox Stove Company of Philadelphia in New York State outside of New York City, has removed from Buffalo, where he has lived for the past ten years, to Central Square, near Syracuse, N. Y., which will be a more central location for him and will better enable him to tend to the needs of his customers.

The old Empire Stove Foundry, at Troy, N. Y., was destroyed by fire on January 28. The foundry, which was one of the pioneer plants of the Troy Stove industry, has not been in active operation for a number of years.

The Curtiss & Pierpont Company, New Haven, Conn., have been given the contract for the Tin roofing &c., on the new factory building for the Winchester Repeating Arms Company.

S. F. Shafer of Findlay, Ohio, is organizing a company to manufacture a new line of Stoves and Radiators invented and recently patented by him.

Charles C. Heath & Co., Baltimore, Md., have been appointed selling agents of the products of W. H. Colebrook, Sons & Co. of Syracuse, N. Y., for Philadelphia, Baltimore and adjacent localities. The last named company are well known as manufacturers of Colebrook's Asbestos Cement, Stove Putty, &c.

The plant of the Ferris Stove Works has closed down pending the final decision of the directors of the company in regard to the removal of their factory to Terre Haute, Ind.

More than a passing impression will be made upon the Stove trade in the interest of the Acorn line by the "Legal Notice," which is being sent out by Carey A. Moore, one of the salesmen of Rathbone, Sard & Co., Albany, N. Y., stating that the party of the third part—Mr. Moore—is desirous of forming a triple alliance in which Rathbone, Sard & Co. and the Stove dealers will be made parties of the first and second part respectively, through the efforts of Mr. Moore in establishing new agencies for the Acorn line of Stoves and Ranges.

Secretary A. H. Dane of the Kalamazoo Stove Company, Kalamazoo, Mich., states that the company's new plant will probably be ready to begin operations about March 1. They will employ at the start about 60 men, but this number will be increased as the plans of the company are completed. The patterns for the different styles of Stoves and Ranges to be manufactured have been completed and progress on the works is going on rapidly.

The annual meeting of A. T. Nye & Sons Company, manufacturers of Stoves and Ranges, Marietta, Ohio, was held recently, resulting in the election of the following directors: H. B. Nye, A. T. Nye, G. L. Nye, M. C. Nye and M. N. Nye. The directors elected G. L. Nye president; M. C. Nye, secretary; H. B. Nye, treasurer, and A. T. Nye, manager. The company's annual report made a gratifying showing, and their prospects for the coming year are said to be flattering. The company's business has grown to such proportions that a large three-story addition to their plant was rendered necessary. This has just been completed, and it will provide the concern with a considerable increase of facilities for producing and handling their goods.

F. W. Trauschke, formerly with D. B. Montague of Springfield, Mass., is now located at 6 Auburn street, Springfield, and will be pleased to receive catalogues from Furnace manufacturers.

The profit-sharing plan of the Scranton Stove Works of Scranton, Pa., referred to in a recent issue, has called forth grateful expressions from the employees who were benefited by it. The molders in the employ of the concern held a meeting a few days ago and tendered a vote of thanks to the company with an expression of appreciation of the interest shown in the maintenance of cordial relations with their employees.

A local report from Phillipsburg, N. J., states that a Stove manufacturing company of Weissport, Pa., are negotiating for the plant of the Phillipsburg Stove Company for the purpose of starting the manufacture of Stoves in Phillipsburg.

The Gunter Stove Works, Bridgeport, Ala., is being put in order and the plant placed in thorough repair for resumption of operations.

The Lizzie Lowman Stove Works, Sheffield, Ala., are about to erect another building adjoining their present site. This addition will about double their present capacity.

The contract for the Hanks Foundry Company's new building at Rome, Ga., has been let and work on the same has begun. This is an industry established on the co-operative plan. Several months ago about a dozen men agreed to pay $25 per month into a fund to be used in establishing a Stove and Cast Iron Specialties plant. Most of them were employees of other foundries. They met their monthly obligation without trouble, often paying in more than the stipulated amount. The money is now all in hand for buildings, patterns, &c., and it is expected that they will be ready for operation by April 1. J. D. Hanks, who was the prime mover in the scheme, is at the head of the new company.

The Grander Stove Company, Royersford, Pa., resumed operations last week, after a shut down of several weeks for repairs.

At the annual meeting of the stockholders of Rathbone, Sard & Co., held at Albany, N. Y., on January 29, the following trustees were elected: Grange Sard, Edward Bowditch, Robert Shaw Oliver, William H. Sard, Edmond Raftery and Arthur M. Blanchard. At the trustees' meeting, held after the stockholders' meeting, the following officers were elected: Grange Sard, president and general manager; Edward Bowditch, first vice-president and treasurer; Edmond Raftery, second vice-president, and Aurora manager; Arthur M. Blanchard, secretary, and Robert Shaw Oliver, general superintendent.

The Keystone Stove Foundry, Spring City, Pa., have started their foundry and will be ready to fill all orders for repairs of Stoves and Ranges formerly made by the Schuylkill Valley Stove Company. The Keystone Stove Foundry are dressing over many of the goods formerly made by the Schuylkill Valley Stove Company, which will be presented to the trade by their salesmen, and E. B. Colby & Co., New York, their authorized agents, as soon as the goods are ready. The Keystone Stove Foundry are a pushing young concern, who mean to do business, and their goods are guaranteed to meet all the requirements of the most exacting dealer or consumer.

Richard B. Tippitt and Emil Budnitz have been appointed by the courts as receivers for the Chesapeake Stove Company of Baltimore, Md., on the application of the Board of Directors of that concern.

The annual meeting of the stockholders of the Patric Furnace Company, Springfield, Ohio, was held at their offices on the 20th ult., when the following officers were elected: President, I. W. Rodgers; vice-president, Lewis Patrie; treasurer, Robert R. McGregor; secretary and general manager, C. F. Smith. The report of the company showed that they did an excellent business in the past year, scoring a very heavy increase over the year preceding. The company have received official notification of the issuance of a patent on their new Hot Blast Furnace. They have recently greatly enlarged their facilities by the building of a new modern foundry plant at the rear of their factory building, and have just entered into an arrangement by which they will begin the manufacture of a line of Kettle Heaters, Farm Stoves and Butchers' Boiling Outfits for the benefit of the local agricultural interests.

A fire on the afternoon of January 28 destroyed the old Empire Stove Foundry, at the corner of Second and Ida streets, Troy, N. Y., with a loss estimated at more than $30,000. The flames originated in the Scale works of James Hislop on the first floor. The foundry, which had not been used for Stove making purposes for a number of years, was occupied, in addition to the Hislop Scale Company, by the Ida Hill Nickel Works, the Empire Stove Repair Works and Frank Henderson, who conducted a tin shop and Sheet Iron Heater business. The Empire foundry was the second oldest Stove foundry in the city of Troy, and had been occupied by a number of Stove manufacturing concerns since the year 1844.

Reports regarding the American exposition to be held in the Crystal Palace, near London, from May to October of this year, indicate a successful undertaking, at least so far as regards the number and quality of exhibits. These exhibits will be confined exclusively to United States products. It is stated that applications have already been received for over 75 per cent. of the available space, and that other exhibits which are practically assured will easily fill the remainder. The desire of the promoters is to secure a thoroughly representative exposition, embracing all sorts of American manufactured goods, particularly in the line of machinery. Among the applications received are those of some of the most representative American firms in this line. The American Advisory Committee in London who are managing the preliminaries include many representative names. Among the number are Henry S. Downe, representative of the American Radiator Company; J. W. Lowner of the National Tube Company, Clark Harrison of the United States Pipe & Foundry Company and Thomas J. Farrell of the American Steel & Wire Company. From present indications it would seem that the proposed enterprise will be the most complete exposition of American manufactured goods ever held abroad.

The Clark Novelty Company.

The Clark Novelty Company, Rochester, N. Y., who are extensive manufacturers of milk can, cream separator, oil can and numerous other sizes an dstyles of brass faucets used for various purposes, are enjoying a very large trade in this particular line of goods. On account of the continual growth they have designed and manufactured many special machines and tools for the finishing of this class of work. The reputation of the concern for furnishing excellent goods is an enviable one, as they have no record of any complaints of leaky faucets during 1901. A representative of the company who has just returned from an extensive Western trip, where he has been shaking hands with the trade and incidentally securing their orders for the coming season, reports business as being good, especially in this line.

The Clark Novelty Company are also well-known manufacturers of all kinds of metal specialties. They operate a large factory, which is fitted with special machinery and tools, and are in position to execute orders for anything in the way of metal goods, light machinery, special tools, &c. They are the inventors and manufacturers of the well-known Clark kerosene oil heating system for heating soldering irons, capping steels, &c. which is becoming largely adopted in canning factories, tinware and sheet metal manufacturing establishments and for other purposes where a heat of this kind is required. Those who operate a system for this purpose would do well to correspond with the Clark Novelty Company.

The Standard Oil Can.

We illustrate herewith the Standard oil can manufactured by the Standard Oil Can Company, Toledo, Ohio, which, the manufacturers claim, possesses a number of points of advantage over other oil cans. A feature of the can is that it is so constructed that it is impossible to overthrow a lamp in filling it. Another point is that the construction of the pump in the can is so arranged that it can be taken apart and repaired and put together again readily, which is not the case with other oil pumps now on the market. The can is manufactured out of the best galvanized iron and tin. It is neatly painted and provided with a cover, which is also painted, preventing it from rusting. The can is made in two sizes, of 3 and 5 gallon capacity. Although the article has been but a comparatively short time on the market, the manufacturers report that they have received orders for these goods from the Atlantic to the Pacific, and from Northern Michigan to the Gulf. Although the company's factory is now working to its full capacity ten hours a day, they state that they are 3000 cans behind on their orders.



The Standard Oil Can.

Hardware Organizations.

Kansas Retail Hardware Dealers' Association.

The fourth annual convention of the Kansas Retail Hardware Dealers' Association was held at Kansas City, Kan., January 16. The headquarters of the association were in the rooms of the Mercantile Club. On account of the illness of President Anderson there was no prearranged programme, and the session was occupied principally in discussing the best methods of obtaining a larger membership, getting hardware dealers in the same town to become better acquainted with each other and other questions of interest to the hardware trade.

Irving A. Sibley, member of the Executive Committee of the National Retail Hardware Dealers' Association, was present at the meeting and delivered a very interesting address on the history and work of the association.

In the absence of the president, Mr. Anderson, Vice-President Oscar Roehr presided, and addressed the meeting as follows:

VICE-PRESIDENT'S ADDRESS.

As presiding officer of this convention the first duty I have is a sad one. It is with extreme sorrow and regret that I announce the severe illness of our president, George Anderson of St. Mary's, Kan. Sorrow for a personal friend and regret that his affliction makes his absence at this meeting unavoidable.

About six months ago Mr. Anderson had an attack of paralysis, which left him entirely helpless. I have a recent letter from his son stating that Mr. Anderson is now unable, and has been for six months, to converse or communicate his ideas in any way, although I believe that his intellect was not affected in the least by the stroke of paralysis which he suffered.

We congratulated ourselves at the last meeting when we elected Mr. Anderson that we had in him an officer eminently equipped for the position, and who had the necessary push and energy to put this equipment into practical use for the benefit of the association. Nor were we mistaken. It was largely through the instrumentality of Mr. Anderson, as the head of our association, that a bill was introduced in our last Legislature licensing peddlers and venders of certain commodities, the principal item of which as hardwaremen we were interested in being stoves and steel ranges.

Mr. Anderson was at the Capitol continually while this bill was being debated, and worked unceasingly until the bill was passed and became a law. Undoubtedly he had other measures in mind for the benefit of the association, which his unfortunate illness prevented him from putting into effect. In his absence to-day we miss a friend and benefactor; therefore let us all hope for his speedy recovery and ultimate return to active life.

I regret and rejoice that the year just passed has not shown any material increase in our membership. Regret for the association and rejoicing for the cause of this lack of growth. Our hardware merchants have undoubtedly had a prosperous year; so prosperous, in fact, that they have had all they could attend to with their immediate business, and as a result interest in association work lagged. The old adage, "Make hay while the sun shines," was never more applicable, for, as surely as night follows day, business depression is bound ultimately to succeed an era of prosperity, and it is at such times, when competition grows hard and merchants are inclined to become aggressive in various ways, that a strong fraternal association at your back is a mighty satisfactory ally.

Personally I have received much pleasure and benefit as a member of this association, and have made many friends whom I prize highly. I feel strongly the honor I have in presiding at this meeting, and my only regret is that there is not a larger membership present.

We should have with us to-day at least 300 members, and this would only be about one-third of the hardware merchants of Kansas.

During this convention I will ask for a short session, devoted entirely to the enlarging of our membership. I thank you for your kind and courteous attention, and now declare the fourth annual convention of the Kansas Retail Hardware Dealers' Association open and ready for business.

The minutes of the last meeting were then read and approved. J. A. Cole, Topeka, then presented his report as secretary-treasurer, as follows:

SECRETARY'S REPORT.

The past year has been an eventful one, and while the Kansas Retail Hardware Dealers' Association has not perhaps prospered to the extent of some of the retail hardware dealers' associations in other States, we may have had more to contend with, as the general verdict is that business has been very good in Kansas this past year, which means that the live hardware merchant has been kept busy with his immediate affairs, and had very little time to think of what benefits might be derived from an association with other dealers.

Your secretary has to report that not one complaint has been received from any of our members, neither that the wholesale hardware houses were selling goods to the consumer nor that the consumers were not buying goods enough from them. Nor has he heard of the steel range people peddling their steel ranges throughout the State, as he had the year previous. Perhaps the bill which our president worked very hard to get through the Legislature, and finally succeeded in getting it to be one of our laws, may have had some effect toward stopping them.

The bill is as follows:

CHAPTER 271.

REQUIRING PEDDLERS TO TAKE OUT A LICENSE.

An act defining peddlers, requiring them to take out a license, fixing the fee therefor and providing penalties for the violation of this act.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF KANSAS.

Section 1. Whoever shall deal in the selling of patents, patent rights, lightning rods, goods, wares or merchandise, pianos, organs, sewing machines, except patent or other medicines, books, charts, maps and nursery stock, agricultural and horticultural products, including milk, butter, eggs and cheese, by going about from place to place to sell the same, is declared to be a peddler.

Sec. 2. No person shall deal as a peddler without a license, and no two or more persons shall deal under the same license, either as partners, agent or otherwise.

Sec. 3. Every license shall state the manner in which the dealing is carried on, whether on foot or with one or more beasts of burden, the kind of cart, wagon or carriage, or, if on the water, the boat or vessel to be employed.

Sec. 4. Any person may obtain a peddler's license by applying to the County Clerk of the county in which he wishes to carry on his trade and by paying the amount herein provided for said license.

Sec. 5. Each peddler shall pay a license tax for the use and benefit of the county in which he intends to carry on his trade, at the following rates: 1, If a peddler travels on foot and carries his goods on foot, $3 for every period of six months; 2, if the peddler travels with one or more horses, or other beasts of burden, $10 for every period of six months; 3, if cart, wagon or other land carriage is used, $50 for every period of six months; 4, if a boat or other vessel is used, $100 for every period of six months.

Sec. 6. All sums received by the County Clerk for peddlers' licenses shall be by him deposited with the County Treasurer and covered into the county general fund for the use of the county.

Sec. 7. Any person who shall be found dealing as a peddler without having paid for and received the license herein specified, or who shall, upon the demand of any sheriff, constable or any householder of the county, refuse to produce his license and permit the same to be read, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than $1 nor more than $100.

Sec. 8. The provisions of this act shall not apply to the selling or peddling of any goods by the owner or his agent in the county in which the *bona fide* owner or agent is a resident tax payer, or in any county immediately adjoining thereto, where such goods are sold or peddled by the owner or from the store or place of business in which the owner keeps a stock of the same kind of goods that are so sold or peddled; and the provisions of this act shall not apply to traveling salesmen doing business with retail merchants, manufacturers or jobbers, or with State, county, township and city officials, whether they carry samples or not; and nothing contained in this act shall be deemed to conflict with or modify the provisions of section 1 of chapter 157 of the session laws of 1897.

Sec. 9. This act shall take effect and be in force from and after its publication in the statute book.

Approved March 2, 1901.

I do not hesitate in saying that this peddlers' license bill would not have been passed last winter had it not been for the untiring efforts of Mr. Anderson, and if it does what we hope and intend it should do the Kansas Retail Hardware Dealers' Association may congratulate themselves, and thank Mr. Anderson that the results of the past year have been by far the best of any so far in our history and something to be proud of.

COMMITTEE ON RESOLUTIONS.

The following Committee on Resolutions was appointed by the chair: Jos. H. Hamilton, Arkansas City, Kan.; T. H. Kinlry, Beloit; F. W. Bartlett, Kansas City, Kan. The committee reported the following resolution:

Resolved, That it is with great sorrow that we learn of the sad affliction to our president, George Anderson of St. Mary's, Kan., and extend to him our heartfelt condolence and hope for his speedy recovery.

The association extended their sincere thanks to the Mercantile Club for the use of their very comfortable rooms for the meeting.

The secretary was instructed to send out a circular letter to all retail hardware dealers in the State and try and interest them in the association.

ELECTION OF OFFICERS.

The following officers were elected for the ensuing year:

PRESIDENT, Oscar Roehr, Topeka.
VICE-PRESIDENT, E. I. King, Logan.
SECRETARY AND TREASURER, J. A. Cole, Topeka.
EXECUTIVE COMMITTEE:
F. W. Bartlett, Kansas City.
T. H. Kinlry, Beloit.
J. M. Walters, Robinson.
Jas. H. Hamilton, Arkansas City.
T. J. O'Neil, Osage City.

Retail Hardware Association in New York State—Who Will Start It?

Several suggestions have been made from time to time looking to the organization of a retail hardware dealers' association in New York State, but thus far nothing has been done. The matter is broached again in the following letter from a merchant located in a town in the central part of the State:

> Can there not be some effort made during the winter months to organize the dealers in this State? It seems to me we are making a mistake in not giving more attention to this matter.
>
> We fully agree with a recent correspondent who said he believed it was a great advantage to any dealer to meet others engaged in the same business and exchange ideas and compare methods. None of us are yet too old to learn.

It is generally conceded that much may be accomplished for the welfare of the trade through a State association. This is indicated in the success which has attended those which have been formed during recent years in the West. That there is a good field for an association in New York, and that there are evils and abuses connected with the hardware business which call for correction, is freely admitted. The jobbers in the State have been organized for years and have a strong association, which is understood to have yielded splendid results. The sister State of Pennsylvania is getting its hardware merchants into line. The trade are apparently waiting for some public spirited and enterprising merchant to take the matter up and give a little of his time to the launching of an association, calling a meeting at some accessible point, where the nucleus of an organization may be developed.

Missouri Retail Stove and Hardware Dealers' Association.

In our last issue we referred to the programme for the meeting of the Missouri Retail Stove & Hardware Dealers' Association at St. Louis, February 18 and 19, at the Mercantile Club. We are requested to state that a fare of one and a fifth has been secured from the Pennsylvania Railroad, date of sale February 15 to 21, good to return up to March 1. Parties attending meeting should buy ticket to St. Louis and secure certificate from agent, which when signed at St. Louis by the secretary of the association will insure a return ticket at one-fifth fare.

In a circular relating to the convention the following appeal to Missouri hardwaremen who are not members of the association is made by the secretary, Frederick Neudorff, St. Joseph:

Mr. Hardwareman:

Concentration, consolidation and combination are the factors in the business world to-day. The union of capital on the one side, the union of all labor on the other, is a fact and has been for some time. The only unorganized body are the middlemen or merchants. What the outcome of this tendency will be no one can foretell. But don't you think it a part of wisdom to be prepared for whatever the future has in store? Singly we can do nothing, united our influence will be respected. Much has already been accomplished by the association for our benefit. It is not just that the few should carry all the burden, and we ask you to become one of us by sending your name and $3 to the secretary and meet with us at our annual meeting.

Ohio Hardware Association.

We are just in receipt of the programme for the eighth annual convention of the Ohio Hardware Association, on Tuesday, Wednesday and Thursday, February 25, 26 and 27, at Columbus. The headquarters of the association will be at the Great Southern Hotel, where the meeting will also be held, there being a large convention hall connected with the hotel. An interesting programme has been prepared and the opinion is expressed that the Ohio hardwaremen who do not attend will miss a treat.

The convention will be called to order on Tuesday afternoon at 2 o'clock, with prayer by the Rev. Dr. Washington Gladden. An address of welcome will follow from J. Y. Bassell, secretary of the Columbus Board of Trade, the response being made by President Scott for the association. The remainder of the afternoon will be devoted to hearing reports, appointment of committees and routine work. The morning session on Wednesday will be opened by A. Rothwell with an address on the subject of "Stoves." This will be followed by report of Committee on National Association, J. P. Duffy, chairman. Hon. F. B. Willis will then address the gathering on the "Iron Industry." W. P. Bogardus, chairman, will report for Committee on Lien Laws. At the afternoon session J. H. Smith of Smith Bros. Hardware Company, will address the convention on "The Traveling Man," and C. W. Jewell will discuss "Honorable Success." The contents of the Question Box will be analyzed at this session. F. A. Powers will read a paper on Thursday forenoon on the topic, "Some Hardware Dont's." In the afternoon the convention will come to a close with reports of committees on resolutions and nominations, election of officers, &c.

On Tuesday evening the members will be the guests of the Columbus dealers, who have arranged a musical entertainment for their benefit. Wednesday evening the annual banquet will occur at the Great Southern Hotel. The speakers at the dinner will be Governor Nash, Hon. F. B. Willis, Colonel Kilbourne, and Henry C. Wiseman.

Geo. M. Gray, Coshocton, corresponding secretary, requests us to announce that the association has secured a railroad fare at one and a third rate on the certificate plan from all points in Ohio.

The Chicago Hardwaremen's Annual Ball.

The Chicago Retail Hardware Association held their ninth annual reception and ball in the North Side Turner Hall, Chicago, on January 22, under the management of the following committees:

Executive Committee: A. J. Englehardt, chairman; Fred. Ruhling, secretary; J. L. Smith, treasurer; W. B. Costello, H. E. Rebman.

Reception Committee: D. McLaughlin, chairman; James Gormley, C. F. Wooley, Martin Engelhardt, A. L. Peterson, Frank F. Porter, E. R. Schlick, J. H. Bixler, C. Carr, Jr.; George J. Pfeiler, W. M. Powers, Otto Hagen, John Schubert, William Winkenwerder.

Floor Committee: W. T. Gormley, chairman; George A. Neeb, George A. Englehardt, E. Sander, A. L. Adam, W. J. Krueger, O. Stebbins.

Refreshment Committee: G. R. Lott, chairman; H. E. Gnadt, J. F. Borchardt, S. Melohn, F. H. Schanze, H. C. Peppler, J. Hora.

The ball was very successful in every respect. The members and their friends turned out in great force and passed a most enjoyable evening. The various committees discharged their duties admirably, all the arrangements contributing to the complete entertainment of those in attendance. The Chicago dealers have always assiduously cultivated the social side of their organization while vigorously pushing the features which have made their association a source of practical benefit to the members. Interest is thus doubly maintained and continuous growth is the result.

Pacific Retail Hardware Association.

The annual meeting of the Pacific Retail Hardware Association was held on January 15 and 16 at Nevada City, Cal. The gathering proved to be a pleasant and profitable one. A good representation of the membership was in attendance. Among the papers read at the meeting were: "Reciprocity in Trade," by Oscar C. Schulze of Dixon; "The Social Side of Business Life," by A. F. Brady of Grass Valley; "Credits and Collections," by Thomas B. Gibson of Woodland.

A number of jobbers and their representatives were present by invitation at the afternoon session on the 16th. Most of the former officers were re-elected for the coming year, as follows:

JOHN C. WHITE, Marysville, president.
OSCAR C. SCHULZE, Dixon, vice-president.
WILLIAM EARLL, Chico, treasurer.
R. W. BOYD, Marysville, secretary.
J. B. GIBSON, Woodland, member Executive Committee.
A. F. BRADY, Grass Valley, member Executive Committee.

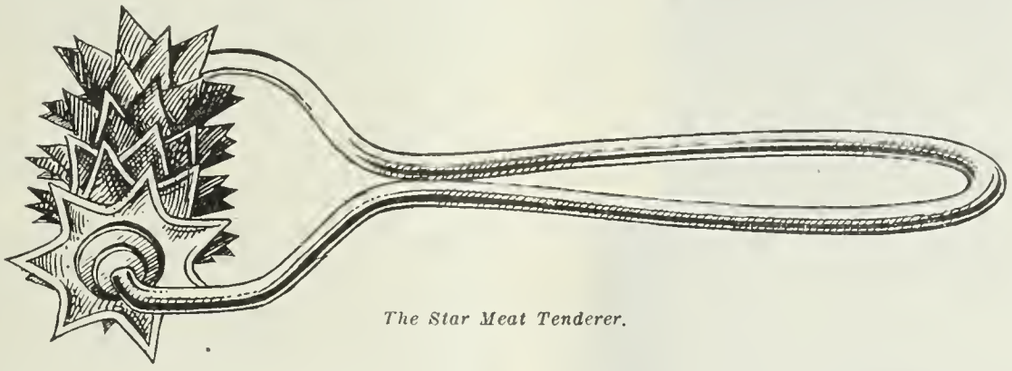
It was decided to hold the next annual meeting at San Francisco. On Thursday evening a fine banquet at the National Hotel was tendered the association by the Hardware merchants and business men generally of the city. Over 100 covers were laid and the occasion proved most enjoyable. Judge F. T. Nilon presided as toastmaster. The following toasts were responded to: "The Association," Oscar C. Schulze; "Co-operation," Hon. E. M. Preston; "The Steel Industry of the Pacific," A. L. Scott of San Francisco; "The Future of San Francisco," Andrew Carrigan; "Uncle Sam Abroad," A. C. Rulofson.

Aluminum Paint.

The Sherwin-Williams Company, 100 Canal street, Cleveland, Ohio, are distributing samples on tin of their aluminum paint for engines, radiators, steam pipes, heater pipes, architectural iron work, &c. The company state that when aluminum paints were first introduced they were not satisfied that the nature of such goods, as then manufactured, would warrant them in placing an aluminum paint on the market. At the same time they saw the value there would be in a properly made aluminum paint, and as the result of experience and study, they claim to have produced a paint that has none of the objections found in others. In a circular referring to the merits of this paint the company say that those who have had experience with other aluminum paints have found that the bronze sets hard and cannot be easily stirred, that the brilliant luster is lacking and that discoloration soon sets in; also that the paint cracks and blisters under the action of heat and cold, and moreover that it has a nauseating odor. The Sherwin-Williams aluminum paint, they claim, has none of these faults, while it has distinct merits of its own. It is said to be a perfect protection for all metal surfaces and to be unaffected by moisture, extreme heat or cold, and will not discolor under the action of lubricating oils or grease. It is claimed to possess great covering capacity and remarkable durability, and to work easily with good drying qualities, withal being as bright as silver.

The Star Meat Tenderer.

The accompanying illustration represents a meat tenderer offered by the Parker Wire Goods Company, Worcester, Mass. The tenderer consists of eight seven-pointed stars, stamped from sheet steel. These are fastened rigidly on a cylinder, with washers between each star. Each point of the stars has its edges dished outwardly from the cylinder. When it is necessary to sharpen, a small flat file may be drawn to and fro against the outward edge of each star, bringing them to a keen cutting edge. In running the tenderer over the meat the cylinder turns, carrying all the stars with it. The manufacturers state that when thoroughly used it never fails to render otherwise tough meat very tender, more palatable and easily masticated, by cutting and separating the fibrous tissues and tendons, which causes toughness in ordinary meats. It is further explained that although highly successful in all cases, the tenderer is especially so with round and rump steaks. The device is designed to retail at 25 cents.



The Star Meat Tenderer.

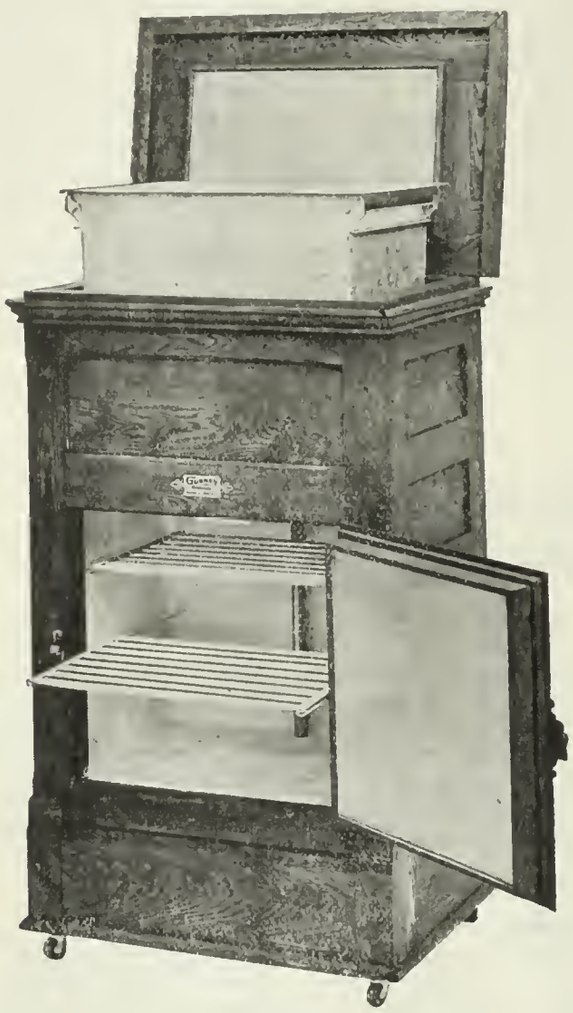
Display of American Goods in England.

One of the fine showrooms of American goods in England is at 124 Holborn, London, E. C. Holborn is one of the two great thoroughfares of London, which lead from the fashionable West End into the heart of the metropolis. On entering the showroom the eye of the visitor is arrested by the handsome display of chafing dishes and tea kettles. Arranged along one side are showcases containing a great variety of mechanics' tools, saws, files, hammers, axes, planes, drills, &c. The right wing is devoted to lamps and oil stoves. In the center of the room is a fine display of refrigerators, carpet sweepers, wringers, washing machines, &c. Lawn mowers and agricultural tools are arranged on the other side of the building. It is the intention of the proprietors to make their showrooms headquarters in England for the display of American inventions and productions of merit.

The founder of this business is John G. Rollins, a pioneer in American business in England, he establishing himself in London in 1866. In 1897 Mr. Rollins was joined by his sons, John G. Rollins, Jr., and Warren D. Rollins, and the firm's name was changed to John G. Rollins & Sons. The English business is under the management of Warren D. Rollins, who makes his residence in that country. The house are well known in the Colonies, and are shipping American goods to almost every country on the globe. The other offices are at 15-25 Whitehall street, New York, and 12 Lancelots Hey, Liverpool.

The Gurney Refrigerator.

Herewith is given an illustration of the improved Gurney lift out ice tank refrigerator made by Gurney & Co., Boston, Mass. The leading feature of this refrigerator, as its name indicates, is the removable ice tank, which construction, the manufacturers claim, gives 20 per cent. more ice capacity than other constructions, while showing from 4 to 6 degrees lower temperature in 30 minutes. The ice tank is made of galvanized iron, with turned edges and riveted joints. It has a center cold air discharge and the ends form complete flues, with circulation measuring 550 feet, anemometer test. The refrigerator is substantially built of hard Northern white ash finished in golden oak with spar varnish. It is made on the most modern theory of insulation, with an



The Gurney Refrigerator.

inside wall of zinc, then a heavy wall of matched lumber and a wall of charcoal sheathing, then a dead air space and another wall of charcoal sheathing. The shelves are made to slide, leaving space at the ends, giving flue circulation, and are all turned, doing away with sharp edges. The drip pan, a new invention, is inserted and will not condense; the drip pipe is removable, with screw air tight joint, and the drip cup is automatic, with gravity action. The hardware is the company's own make, of solid, heavy brass, and the lid holder is automatic. The refrigerator can be readily cleaned in all parts. It is made in four sizes, to accommodate 45, 63, 90 and 106 pounds of ice respectively.

In a special illustrated article the *Sentinel-Leader* of Warren, Ill., gives a glowing description of the factory and management of the Elliott Mfg. Company of that town. The company started a little over two years ago with a capital stock of $20,000 to manufacture the Elliott Anti-Rusting Tinware, and the enterprise has achieved a marked success. They are planning to begin a large extension of their plant in the early spring. The officers of the concern are: W. F. Conyne, president; Joseph Appel, vice-president; J. A. Brooks, secretary and general manager, and James Bayne, treasurer.

Stove and Hardware Dealers.

A. B. Hendryx, New Haven, Conn., has issued a new catalogue showing his Bird Cages and Metal Specialties.

The Safety-Bright-Light Mfg. Company, 520 Franklin street, Peoria, Ill., are distributing a circular in folder form descriptive of their Safety-Bright-Light Gasoline Gas Lamps. The main feature of these Lamps is the improved generator and packing. The claim is made that these Lamps are perfectly safe, because the gasoline is not confined in any way nor is extra pressure used. The Lamps are included among the devices permitted by the National Board of Fire Underwriters. The Lamps are constructed of highly polished brass and are warranted for one year as to workmanship and material. They are manufactured in several designs for use in homes, large buildings, or the open air.

H. E. Sturtevant has secured the New York agency of the Wagner Mfg. Company of Sydney, Ohio, makers of high grade Cast Iron and Aluminum Hollow Ware. Mr. Sturtevant's headquarters will be with the Neal & Brincker Company, 18 Warren street, New York, where he will carry a line of samples and a stock of staple goods.

The fire which recently destroyed the plant of the Standard Oil Can Company, Toledo, Ohio, caused a serious interruption to their business, which has now, however, been overcome by the removal of the company to a new plant on Bancroft street, from which they are now shipping their product.

Baldwin & Wilson have bought out the Hardware, Stove, Sporting Goods and Building Material business formerly conducted by Acker & Cole, Fayette, Ohio, and will continue at the old stand.

W. A. Kehnast, Defiance, Ohio, who has been in the Hardware and Stove business at that point since April 1, 1870, has taken into partnership two of his oldest clerks, Abraham Smith, who has been identified with the business for 14 years, and Henry Roehrs, who has been connected with it for a period of 12 years. Mr. Kehnast alludes to this action as in the nature of a reward for faithful service. The new style of the concern will be the W. A. Kehnast Company.

O. Lindemann & Co., 81 Beekman street, New York, are sending out a catalogue of 42 pages, showing their line of Japanned, Brass and Tinned Wire Cages, also a full line of Cage Sundries.

Bayside Mercantile Company, Bayside, Borough of Queens, New York City, will value catalogues, price-lists and quotations relating to Hardware, Oils, Paints, House Furnishings, &c.

Swinton & Co., Port Jervis, N. Y., request catalogues, price-lists, &c., relating to novelties in Hardware Specialties, Wooden Ware and House Furnishing Goods.

Barbour Hardware Company, dealers in Hardware, Stoves, Furnaces, &c., East St. Louis, Ill., have increased their capital stock to $20,000.

Several months since Hughes & Curtiss, Downer's Grove, Ill., opened a branch store at Naperville, where they are carrying a large and varied stock, embracing Heavy and Shelf Hardware, Tinware, Farming Tools and Implements, Wooden Ware, Paints, Oils, Wagons, Buggies, Carriages, &c.

C. F. Luthy, Millersburg, Ohio, has disposed of his stock of Hardware, Stoves and Agricultural Implements to Lemon, Kreiger & Miller, who took possession on the 7th ult. Mr. Luthy has been engaged continuously in the Hardware business for 35 years with the exception of the period 1898-1900, during which time he was identified with the wholesale notion house of the Stuber, Luthy & Gregg Company. Mr. Luthy has not yet decided what business he will take up, but has several things in prospect.

Rouse & Byram, Abingdon, Ill., have been succeeded by Main & Byram, who will continue the sale of Shelf Hardware, Stoves, Tinware and Farming Implements.

Voss Bros. Mfg. Company, Davenport, Iowa, manufacturers of the Ocean Wave Washing Machine, have just let a contract for another building, which will double their capacity. This makes the third addition to their factory within the last six months and shows the growing popularity of their Washer. The company are over 400 Machines behind their orders and are kept busy apologizing for the delay in shipments, and asking the trade to bear with them for a short time until they get in shape to ship more promptly.

The Baltimore Stencil & Mfg. Company of Baltimore, Md., have erected a two-story building, 80 x 200 feet, on Bush street, in which they are installing machinery for the manufacture of Galvanized and Japanned Ware, &c. Frank Guldener is president of the concern, J. R. Karle, vice-president, and Ernest Sharp, secretary.

Tracy & Robinson, dealers in Hardware on Asylum street, Hartford, Conn., have recently taken W. D. Williams into partnership. The name of the new firm will hereafter be Tracy, Robinson & Williams.

The early buyers are now placing their orders for Ice Cream Freezers, Ice Crushers and similar goods, and with a view to securing their interest the North Brothers Mfg. Company of Philadelphia, Pa., are sending out a new 24-page catalogue on buff paper, in a blue cover, devoted to their Lightning, Gem, Blizzard and Crown Ice Cream Freezers. The Lightning Freezers are made in large sizes, to be operated by power. The catalogue shows a variety of Packing Tubs and Packing Cans, besides the Rapid Ice Breaker, to be operated by power, and the Lightning, Gem and Crown Ice Chippers and Shavers.

The officers of the Iowa Retail Hardware Dealers' Association have changed the headquarters for their Des Moines meeting, February 18-20, from the Savery to the Kirkwood Hotel. The programme of this meeting was given in our last issue.

Rummel & Wright, Iowa Falls, Iowa, have disposed of their Hardware, Stove, Agricultural Implement and Sporting Goods business.

Under date of January 22 the Cincinnati Pump Company announce that they have purchased the entire plant of the Bucket Pump Company, and with additional machinery are now in a position to execute orders more promptly and advantageously. The works have recently been moved to Liberty and Clay streets.

The New Jersey Aluminum Company, Newark, N. J., have just issued their catalogue for 1902, showing their line of fancy articles and specialties in Aluminum which they are now manufacturing. The catalogue consists of 32 pages, well printed and illustrated, and bound in a brown paper cover, printed in bronze and aluminum.

The Berger Mfg. Company, Canton, Ohio, are sending out a small pamphlet, with the title "Light *vs.* Darkness," in the interests of their line of Lanterns. Illustrations are given of a number of styles of Hand Tubular Lanterns, also Lanterns for dashboards, railroads and side walls, with Hanging Lamps, Tubular Globe Street Lamps and Tubular Headlights. Reference is also made to the company's Crystal Valve Oil Can, made of heavy crystal glass and protected against explosion or fracture by strong wire guards.

W. H. Millspaugh has purchased the stock and fixtures of Coe & Timerman at Oneida, N. Y., and will hereafter carry on his retail Stove business in the store lately occupied by that firm.

H. A. Currier has sold out his retail Stove and Hardware business to L. J. Currier and E. A. Jones.

Frank E. Sherman has bought from I. P. Haynes the building and stock and good will of the Bar Harbor Stove Company, retail dealers in Hardware, Stoves, &c., at Bar Harbor, Maine. Mr. Haynes was compelled to give up business owing to ill health.

W. A. Sherman, 309 River street, Troy, N. Y., is preparing to make a special display of Stoves, House Furnishing Goods, Tinware, Refrigerators, &c., during the week of February 17-22, which all Troy merchants will make a gala week, it being the time of the holding of Troy's Industrial and Mercantile Exposition.

James U. Pomeroy, secretary of the Rochester Lamp Company, died on January 19 of diabetes, aged 32 years. He was born in Rochester, N. Y., and at an early age entered the employ of his uncle, Charles S. Upton, proprietor of the Rochester Lamp Company. On Mr. Upton's death Mr. Pomeroy became president of the concern. Two years ago his health began to fail, and he resigned the presidency in favor of Frank C. Jones and took the office of secretary.

Gardner & Hughes, Lancaster, Ohio, are moving their retail Stove and Tin store into larger quarters. When the removal is completed the firm will have one of the most conveniently arranged and best equipped plants of the kind in Ohio.

A. M. Smith, dealer in Hardware, Stoves, Agricultural Implements, Sporting Goods, &c., Chapman, Neb., has disposed of his business to John McCormick.

C. M. Moore is successor to Barnes & Moore in the Hardware, Stove and Sporting Goods business in Comanche, Texas.

MacLennan & Nelson are successors to MacLennan & Graham in the Hardware and Stove business in Bemidji, Minn. The firm do both a wholesale and retail business and have recently taken possession of new quarters.

M. J. Finch has sold out his Hardware store in Hawarden, Iowa, to W. H. Wilkinson, who continues at the old stand. Mr. Wilkinson's line embraces Hardware, Stoves and Tinware, Plumbing, &c. He has added considerable new stock.

W. J. Meyer has succeeded Covell & Son, Idana, Kan., dealers in Shelf and Heavy Hardware, Stoves, Tinware, Harness, &c.

A. C. Rickly & Co., who lately embarked in the Hardware, Stove, Tinware, Farm Implement and Sporting Goods business in Hobart, O. T., are expecting soon to erect an addition to their store in view of the growth of their trade.

Rouch Bros. have opened up in business at Dover, O. T., handling Shelf and Heavy Hardware, Stoves and Tinware, Farming Implements, Sporting Goods, &c. They occupy a new brick building erected especially for their business.

The Orange Hardware Company, Orange, Va., on November 18 last disposed of their entire stock of Hardware, Building Material, Stoves, Agricultural Implements, Vehicles and Harness to the Greiner-Ricketts Hardware Company, who continue at the old stand.

Charles Reisinger, for several years with the James C. Lindsay Hardware Company, Pittsburgh, Pa., has bought out the Hardware business of Frazier & Smith, 1236 Liberty street, Franklin, Pa. Mr. Reisinger is putting in a new metallic ceiling and new showcases, and making other improvements. He will carry a full retail stock of Hardware and also job plumbing goods. The business will be conducted under the style of Franklin Hardware Company.

B. S. Prunty has succeeded Prunty & Iseninger in the Hardware, Stove and furniture business at Grimes, Iowa.

The Household Mfg. Company, manufacturers of Tin Kitchen Ware, 82 North street, Boston, Mass., were visited on January 24 by a fire which damaged their factory.

According to the *Railroad Gazette* the total output of the eight locomotive building companies of the country, representing 15 plants, for the year 1901 was 3384. This is 231, or 7.3 per cent., more than in 1900, and the record. The output from 1890 to 1900 follows: 1890, 2240; 1891, 2865; 1892, 2012; 1893, 2011; 1894, 695; 1895, 1101; 1896, 1175; 1897, 1251; 1898, 1875; 1899, 2473; 1900, 3153. Less than 10 per cent. of the locomotives built last year were for export, as against about 16 per cent. in 1900.

According to statistics collected by the Census Bureau the gross value of the products of manufacture in the United States in 1900 was $13,008,127,682, as compared with $9,372,437,282 in 1890, an increase of 38.73 per cent.

Friedley & Voshardt's Metal Ceilings.

Some very attractive as well as extensive work in metal ceilings has recently been put in place in Memphis, Tenn., by Friedley & Voshardt, 194 to 202 Mather street, Chicago. The employment of this Chicago firm for the erection of these ceilings at such a distant point is a high tribute to the excellence of the work, the character of the designs and the reputation of the firm. Illustrations are herewith given of the work thus done. Fig. 1 shows a ceiling placed in the Hunter Building, in which a large surface was covered by one of the firm's finest designs. Fig. 2 shows the ceiling placed in the Napoleon Hill Building. In this building 600 squares were used, as well as 2 miles of beam molding. These ceilings are constructed of Nos. 28 and 29 soft steel sheets connected by the firm's patent joints. They make a great variety of designs for steel ceilings, which are illustrated in a large catalogue which they have quite recently issued, showing not only borders, panels and other parts of ceilings, but also a great deal of other work in sheet metal ornaments.



Friedley & Voshardt's Metal Ceilings.—Fig. 1.—A Ceiling in the Hunter Building, Memphis, Tenn.



Fig. 2.—A Ceiling in the Napoleon Hill Building.

Artistic Sheet Metal Stamping.

We made mention recently in these columns of the completion of the plant of the Laughlin Nail Company, Martin's Ferry, Ohio, for the production of black sheets for use in their corrugating, galvanizing and metal ceiling works. Herewith we are enabled to illustrate an example of their stamped work in sheet metal which suggests very strikingly the possibility of sheet steel as a medium of artistic expression. These two pieces are each 18 x 48 inches in size and were stamped from 28-gauge Bessemer sheets, rolled and annealed at the Laughlin sheet mills, for the use of their ceiling department. The method of applying these plates is novel and effective. The pieces are provided with an extra or a double bead on two sides of the plate, the outer one being of such size as will nest within the bead of the next adjoining plate, concealing the raw edge of the sheet perfectly and rendering it entirely unnecessary to swedge the joints. Only enough nailing is required to hold the pieces in place, as the joints are stiff enough to retain their position without nailing them tight. Experienced workmen, the company say, claim to be able to erect double the quantity of this metal over the old single bead styles in a given time. This feature of the company's products will undoubtedly prove attractive to ceiling men. The company employ a corps of competent draftsmen and are prepared to furnish drawings and estimates promptly. They are preparing a catalogue of their products in this line and pending its completion they are ready to execute orders, sending photographs with their estimates.



Artistic Sheet Metal Stamping.

Interior Decoration in Metals.

"One of the most notable tendencies in interior decoration just now," said an architect, "is to introduce the metals, especially copper, to take the place of wood and plaster. Closet doors, panels, jambs between ranges of small windows, ceilings and cornices are more and more being made of copper and compositions in which copper is used and, with the constantly increasing means of cheap production and working of metals, this practice is likely to be extended still further.

"Frequently now metal is being used as the outer casing for wood work, and the result is both original and highly decorative. Besides this the metals are used in grilles in and about fire places and in moldings to inclose marble and tile linings.

"The extension of the electric light first created a demand for light hand wrought fittings in metal, and from that the use of that material extended quickly to fire screens, stands, trays, flower and lamp standards and to all the 101 small objects that crowd the modern drawing room. From these to the room itself was an easy transition.

"But the demand that everything about a modern high class dwelling shall be fire proof as far as pos-

sible is a factor which has helped to push metal work along to take the place of wood. The time is coming when the use of the latter will be reduced to a minimum in a fine house."

FLUTED CAKE PANS.

A perspective view of a round fluted cake pan is shown in Fig. 1. This may be made of IX tin, using the small beading machine and round pliers. Assuming that a round pan is desired, with a 10-inch bottom diameter and 1-inch high flutes, as shown in Fig. 2, then set the compass to 5-inch radius and, with A in Fig. 3



Fig. 1.

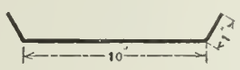


Fig. 2.

as center, describe the circle B; add 1 inch for the flute and describe the circle C.

Using the small beading machine, turn a bead of the smallest roll on the circle B, when it will look as shown by *e* in the small diagram in Fig. 3. Then, using the pointed or round pliers, turn the outer 1-inch edge upward in the direction of the arrow *f*, at the same time turning one corrugation right, then the other left, continuing in this manner in the same corrugation a number of times around the outer 1-inch edge until the proper flare has been obtained as shown in Fig. 2, the corrugations looking as shown in the perspective view, Fig. 1.

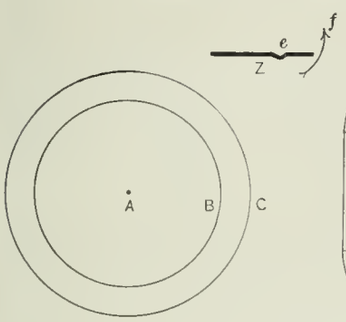


Fig. 3.

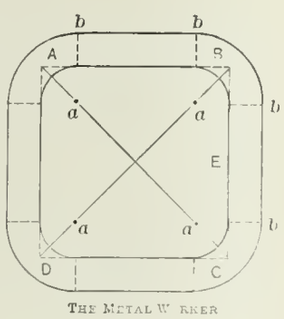


Fig. 4.

A SQUARE PAN.

If a square pan is desired with rounded corners proceed as shown in Fig. 4, where A B C D shows a 10-inch square. Draw the diagonals A C and B D; then, with the desired radius and *a*, *a*, *a*, *a* on the diagonal as centers, describe the quarter circles shown. Add the distance of the flare, as shown, and strike the outer arcs. Then, using the small beader, turn a bead on the line E. The crimps or corrugations only take place on the rounded corners *b*, *b*, &c., the flare on the straight portions being entirely flat.

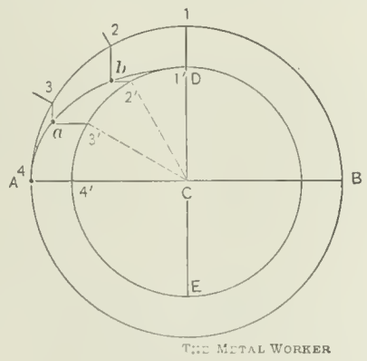


Fig. 5.

AN ELLIPTICAL PAN.

Should occasion arise that an elliptical pan is desired, the method of turning the flare is the same as above described, but the blank for the elliptical pan is obtained as follows: In Fig. 5 draw any line, as A B, representing the length of the pan, and D E, the width of the pan. With C as center describe the circles A B and D E. Divide the quarter outer circle into equal spaces, as shown, from 1 to 4. From these points draw radial lines to C, intersecting the inner circle at 1', 2', 3' and 4'. From the intersections on the outer circle draw vertical lines and from the intersections on the inner circle horizontal lines, similar lines intersecting each other at 4, *a*, *b* and 1', through which draw the quarter elliptical curve. Trace this curve between each of the quarter circles and the result will be a true ellipse, to which the flare of the pan must be added.

SHORT RULE FOR PITCHED COVER WITHOUT ALLOWANCE FOR LAPS.

In the accompanying illustration is shown a short rule for obtaining the pattern for round pitched covers of any diameter or hight. Supposing a pitched cover is

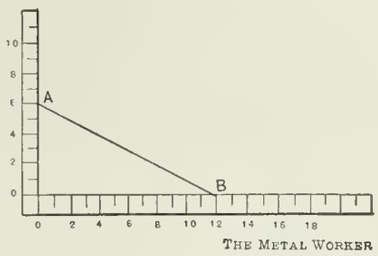


Fig. 1.—*Obtaining Radius from Steel Square.*

desired 24 inches in diameter and 6 inches high and the pattern is to be laid off directly onto the metal without the use of any drawing. Then proceed as is shown in Fig. 1, which gives a diagram of a steel square with the various dimensions on same. Now place one point of the compass on 6 on one arm of the square, which represents the hight, and the other point on 12, representing the half diameter; then will this distance, A B, be the radius with which to strike the pattern. Now with any point, as A in Fig. 2, as center, describe the arc B B¹. Multiply the diameter 24 by 3 1-7, which will equal 75 3-7 inches, the circumference of the 24-inch circle. Divide by 2 for the half pattern, which leaves

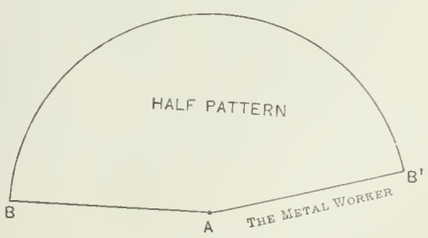


Fig. 2.—*One-Half Pattern.*

37 5-7 inches. Set the dividers 1 inch distant, and step off 37 1-inch spaces on the arc B B¹, starting from B. Divide the inch division on the rule into seven equal spaces and add five of these spaces on the arc B B¹. Draw a line from A to B and A to B¹, which will complete the one-half pattern for the cover.

ACTIVE work has been started on the ten-mill Sheet plant to be built by the Rolling Mill Company of America at South Connellsville, Pa. It will be recalled that George J Mumbert, who was manager for some years of the Connellsville works of the American Tin Plate Company, is identified with this concern. It is possible that later on a blast furnace and an Open Hearth Steel plant may be built, in order to give the concern their own supply of Steel.

The Youngstown Iron & Steel Roofing Company.

The new sheet mills of the Youngstown Iron & Steel Roofing Company, which were started up in September, are running very satisfactorily. The concern are manufacturers of both black and galvanized sheets in iron and steel, iron and steel roofing and siding, Youngstown corrugated expanded metal lath, trough bridge flooring, fire proof flooring and other specialties. Rolling their own sheets for the manufacture of these goods, the concern are able to guarantee quality. C. A. Cochran has recently been appointed secretary of the company. L. E. Cochran, who has been in the iron business in the Mahoning Valley for many years, is president; G. M. McKelvey, vice-president; Mason Evans, treasurer, and John O. Pew, general manager. The concern maintain branch offices in Philadelphia and also in the Park Building, Pittsburgh, the latter office being in charge of L. E. Aber.

The American Rolling Mill Company.

The American Rolling Mill Company, whose general offices are in the Rookery Building, Chicago, have purchased the rolling mill at Sandwich, Ill., which has been idle for some time. This plant has a 9-inch finishing train of rolls and an 18-inch three-high muck mill. Within a few weeks the company will arrange for a 16-inch train of finishing rolls and will also build eight double busheling and puddling furnaces. These improvements will place the works in good condition and will enable the company to considerably increase their production of bar iron. They are further starting their basic open hearth steel furnace at Muskegon, Mich., and will begin to roll billets in a few days. Another open hearth furnace will shortly be built at this plant, which will more than double its steel capacity. They will need most of the billets produced here for their own use.

Sheet Metal Workmen's Wages.

Arrangements have been made which promise to bring about more amicable relations between the sheet metal factories of Chicago and the workmen employed in them. Committees from the Sheet Metal Contractors' Association and the Sheet Metal Workmen's Union met on the 23d inst. and organized a joint arbitration board, to which will be referred all disputes regarding the scale of wages, hours of labor and apprentices. Johnston McIlroy of the McIlroy Cornice Company was chosen chairman, C. D. Wheeler of the Sheet Metal Workmen's Union secretary and Harry C. Knisely of the employers' association treasurer. The arbitration board will consist of 11 members, of whom five will be chosen from the employers and five from the workmen. The other member of the board will be chosen from a list of six names, which have been submitted to the board. This eleventh man will be called in to act in case of a tie vote on any proposition on which a majority cannot agree. It also was decided that the recent wage scale agreed upon is to date from January 11. The action taken is very important, as peace is thus assured in a branch of trade which has been much disturbed by labor troubles.

Dinner to Eugene W. Pargny

The Inn, at Vandergrift, Pa., was the scene, on Friday evening, January 24, of a dinner given to Manager Eugene W. Pargny of the American Sheet Steel Company, in honor of his return from Europe after an absence of three months. The affair was planned as a little surprise by Mr. Pargny's friends of the Vandergrift-Apollo unit, and was attended by the heads of all the departments of those works, which included the mills at Vandergrift, Apollo, Leechburg, Hyde Park and Saltsburg, which mills are all under the direct management of Mr. Pargny, with S. Arch Davis as division superintendent. The latter, as master of ceremonies, made the address of welcome, calling forth a very nice response from Mr. Pargny, after which each one present made a few remarks, assuring the manager of their continued hearty support in striving to maintain the high position their works hold as a part of both the American Sheet Steel Company and the United States Steel Corporation. Among the guests from out of town were P. F. Smith, manager of Woods and Wellsville works; S. B. Ely, chief engineer, and R. A. McKinney, purchasing agent.

Bruce & Cook.

The following circular issued by the well-known and old-established tin plate and metal house of Bruce & Cook, New York City, under date of February 1, 1902, will be of wide interest to the trade:

"The partnership heretofore existing under the firm name of Bruce & Cook and doing business at 190 Water street, New York, has this day been dissolved by mutual consent. All debts and accounts owing to or from said firm will be liquidated at the office of the firm at the above address.

(Signed) "Russell W. McKee, Spencer A. Jennings, Philander R. Jennings, Frank C. Jennings, A. Gardiner Cooper, Elsey C. Cook and Estate of I. R. Bruce."

"The undersigned have this day entered into a copartnership under the firm name of Bruce & Cook, and will continue the business heretofore carried on under the same name at 190 Water street, New York City.

(Signed) "Spencer A. Jennings, Philander R. Jennings, Frank C. Jennings and A. Gardiner Cooper."

FLASHINGS.

The American Rolling Mill Corporation, who reorganized at the beginning of the year and increased their capital stock to $1,000,000, have elected the following officers: President, L. C. Straight; secretary, F. W. Peck, Jr.; general manager, W. I. Moody. The following are directors: F. W. Peck, Sr.; John S. Cooper, W. I. Moody, John H. Palmer and C. I. Peck. The company operate mills at Muncie, Ind., Muskegon, Mich., and Sandwich, Ill.

Frederick M. Strong has resigned as manager of the Elwood, Ind., plant of the American Tin Plate Company to become the head of a new company who will erect an independent Tin Plate plant at Greencastle, Ind.

The Metal Ware Selling Company have been incorporated under New Jersey laws, with a capital stock of $250,000, to manufacture Galvanized Iron and other Metal Ware. The incorporators are Gordon Gordon, William S. Whitman, Franklin Griggs, Frederick L. McAfee and J. Bailey.

The Budke Iron & Mfg. Company, now being organized by Senator Budke of Canonsburg, Pa., and others, with a capital of $800,000, propose to erect a plant near Shannopin Station, on the Pittsburgh & Lake Erie Railroad, for the manufacture of Sheet Iron and Steel. Ground at the above named location has been secured, and as soon as the company are thoroughly organized preparations will be made for the erection of the works.

A meeting of the stockholders of the Youngstown Iron, Sheet & Tube Company was held in Youngstown, Ohio, on January 23, and the capital stock of the company was increased from $2,000,000 to $4,000,000. An increase was made in the Board of Directors, H. C. Dalton of Pickands, Mather & Co. of Cleveland and James Parmlee, also of Cleveland, being added. S. V. Hubner & Co., consulting engineers, of Pittsburgh are drawing plans for the open hearth plant to be built by this concern, and which will also comprise a blast furnace to supply metal. The puddling department of the Youngstown Iron, Sheet & Tube Company has been started, making Iron from which Iron Sheets will be rolled for covering their own buildings.

Two mills of the Sheet plant of the Maryland Sheet & Steel Company, Cumberland, Md., have been placed in operation. The 32-inch mill will be placed in operation shortly. The open hearth furnace in the plant which has been enlarged to 20 tons capacity, will be started about February 15. The blooming mill will also be placed in operation about that time, and the Sheet Bars required

will be rolled from the Steel made in the open hearth furnace. The mills are equipped to roll Sheets from 10 to 18 gauge. The five steam hammers in the plant will also be started soon.

The directors of the Parkersburg Iron & Steel Company of Pittsburgh, whose Sheet mills are located in Parkersburg, W. Va., met there last week and elected the following officers: H. H. Neiman, president; A. H. Geilfuss, secretary; John F. Budke, vice-president and general manager; H. S. Duncan, vice-president and business, manager; L. A. Myvel, treasurer; A. E. Neiman, assistant treasurer. The directors are G. Succop, Captain W. H. Geilfuss, W. H. Paxton, Charles Geilfuss, Frank W. Budke, and A. P. Flowers, all of Pittsburgh.

It is expected that the buildings at Hammond, Ind., formerly used by the Corning Steel Company for the manufacture of Sheets will be utilized for the building of cars. This property was purchased about two years since by the American Sheet Steel Company, who dismantled the works last summer and removed the machinery to their other plants. They have recently disposed of the ground and buildings to Torbert & Beckham, Monadnock Building, Chicago.

Broderick & Quinlin, boiler makers and sheet iron workers, Montpelier, Ind., have incorporated their business under style of Broderick & Quinlan Mfg. Company. They have during the past four months enlarged their plant and installed new machinery.

The Stark Rolling Mill Company, Canton, Ohio, have decided to add two more hot mills to the four now in operation. They are at work on a new brick and steel warehouse 200 x 50 feet.

Goff, Horner & Co., Limited, Pittsburgh, have acquired an interest in the property of the Curtis Sheet Steel & Corrugating Company of Zanesville, Ohio, and at the same time have arranged that all the buying and selling of materials for the company shall be conducted through their offices at Pittsburgh. All contracts for both raw and finished material have been assumed and will be executed by Goff, Horner & Co., to whom all inquiries for the product of the mills should be sent. Black and Corrugated Sheets are now being manufactured and a galvanizing department is almost completed. Four mills are now in operation and another one will probably be added at once, when the plant will have an output of 1250 to 1500 tons per month of Black, Corrugated, Galvanized and fine grade Pickled and Cold Rolled Sheets.

A small catalogue has been received from the E. W. Bliss Company of Brooklyn, N. Y., dealing with their Presses, Dies, Shears and Special Machinery. While having a very complete line of standard machines, the company make a specialty of designing and manufacturing machinery for special purposes.

In addition to the plant now under construction the Carnahan Stamping & Enameling Company, Canton, Ohio, will erect a galvanizing department, contracts for which have just been let. The plant will be in full operation about March 1.

The Juniata Tin Plate Company, capitalized at $250,000, will build a Black Plate mill and Tin Plate factory at Greencastle, Ind. F. M. Strong, for several years manager of the Elwood plant of the American Tin Plate Company, has resigned that position to take charge of the new company. Associated with him are Samuel Lewis, William H. Richards, J. H. Seiberling and H. M. Strong.

Work on the new Tin Plate plant of the McKeesport Mfg. Company, at Port Vue, near McKeesport, Pa., will shortly be started. The equipment of the plant will be of the most modern description. It will embrace ten mills, with a capacity of from 35,000 to 40,000 boxes of Tin Plate per month. The plant will be reached by the Pittsburgh & Lake Erie and the Baltimore & Ohio railroads, and it is expected that the company will be ready to ship their products late in the coming summer. The stockholders of the concern are: E. P. Douglass, J. C. Smith, Dr. J. W. Fawcett, Dr. E. T. Nason, G. F. Meyer, R. T. Carothers, E. R. Crawford, J. E. Lauck and E. W. Pitts of McKeesport and William Curry of Pittsburgh. Mr. Crawford will be general manager and Mr. Lauck superintendent.

Although the quantity of Tin Plates exported from the United States is still comparatively small, the exports in the calendar year 1901 showed a material increase over those of the preceding year, being, in 1900, 612,251 pounds and in 1901, 983,383 pounds, a growth of nearly 60 per cent.

The examination of the sales sheets of the American Sheet Steel Company for the 60 days ended December 31, 1901, to determine the wage rate for Sheet Steel workers for the months of January and February, 1902, showed that no advance in wages was due the workers for those months.

The total exports of Tin and Terne Plates from Great Britain to the United States in the 12 months ended December 31, 1901, amounted, according to the official returns of the British Board of Trade, to 75,819 tons, as compared with 58,043 tons in the calendar year 1900. This is the first year in which an increase in the shipments of Welsh Tin Plates to this country has occurred since the coming into effect of the McKinley tariff in 1891. The growth was obviously due to the scarcity of domestic Tin Plates, caused by the prolonged strike at the American mills last summer.

George C. Hartman has opened a tin shop in the William Denkel Building, Bridgewater, Va.

W. R. Calkins & Son have opened a new tin shop in the S. McGirr Building, New Lexington, Ohio, where they are prepared to do all kinds of tin roofing, spouting and sheet iron work. They are also manufacturers of Tinware.

The Cooper Union.

The announcement was made this week that Abram S. Hewitt and Edward Cooper, with other heirs of Peter Cooper, the founder of Cooper Union of New York City, had given the handsome sum of $600,000 as an endowment fund to that institution. At the same time it was stated that Andrew Carnegie had supplemented the gift of $300,000 he made to the institution in 1899 by a second donation of like amount. Thus the Cooper Union is richer by $900,000, the income from which sum will enable the trustees to extend greatly its sphere of usefulness. In the first place the additional income thus secured will make possible the occupation of the entire seven-story brownstone structure of the Cooper Union for purposes of education. Heretofore a portion of the building has been rented in order to obtain additional funds for the work of the institution. Now all this rented space will be used for the purposes for which it was originally designed. The free evening classes in science and art will be strengthened and instruction will be provided for a greater number of students. The physical and electrical laboratories are also to be enlarged and the institution, as a whole, made as complete as possible.

The additional funds will also enable the trustees to provide for the accommodation of more day pupils. At present some 60 young men are being given special instruction on technical and mechanical lines in the day classes. This number can be largely increased. Indeed, it is remarkable that many more young men do not embrace the remarkably favorable opportunities for obtaining a free training in civil and mechanical and electrical engineering and in chemistry offered in the Cooper Union day classes with their magnificent mechanical and laboratory equipment. This is the second season of these classes, and yet the attendance on them falls considerably short of their capacity. While there are more applicants for admission to the evening classes than can be accommodated, the day classes are comparatively neglected. At present 2800 students are receiving instruction in the various classes of the Cooper Union.

What is claimed to be the largest pane of glass in the world was turned out recently at the Kokomo Plate Glass Factory, Kokomo, Ind. It was 150½ x 221½ inches, and weighed 1450 pounds finished. In the rough it weighed 2900 pounds, taking 20 men to carry it. It was successfully finished and crated and is said to be flawless.

Making Sewer Connections.

BY J. N. S.

The question is asked: Which is the best, terra cotta or extra heavy cast iron pipe, for a sewer? It is to be presumed that the question has no reference to the main sewer in the street, but to the pipe leading from the main sewer to the house for the purpose of carrying off the waste waters, &c. If that is what is meant I should say extra heavy cast iron pipe well tarred inside and out. It will last from 50 to 75 years under ground, and therefore could well be afforded by the owner should he live that long and have need to renew it. Why is it best? Because it is not easily broken and because it is made in longer lengths, therefore will not be so liable to sag. Moreover, the method of connecting will prevent the roots of trees and shrubs from working their way into it and stopping it up.

The conclusion that cast iron pipe is the best to use for a sewer at once disposes of the terra cotta pipe, whether glazed or unglazed. But I might be allowed to say that unglazed terra cotta pipe should never be used in any case. It is porous, easily broken and not so smooth as the glazed pipe; therefore it should be discarded as unsanitary and not fit to be used. The only reason why earthen pipe is used at all is because it is cheaper and a common laborer can lay it. It can be argued that the glazed terra cotta pipe will last longer under ground. But has a sewer of any great length ever been uncovered which was not stopped up and in which all the joints were found perfectly tight? The hubs crack from natural causes and leak. Besides, terra cotta is generally condemned and considered unsanitary for inside work, so, if it is not good for inside use it ought not to be considered as best for the outside.

I have seen earthen pipe broken by stones falling on it in filling in, and I have also seen where it has sagged on account of the earth being soft and spongy, with the result of the joints being broken. I have had to remove terra cotta pipe sewer connections on account of the roots of trees and shrubbery growing inside the pipe. It is wonderful how fast they will grow once they get an opening in the pipe. I have known the roots to grow for 20 and 25 feet and nearly always toward the house on account of the grade. They grow until they entirely stop up the sewer. So much for which is the best pipe to be used.

CONNECTING A HOUSE DRAIN.

The question which is the best way of connecting to a main sewer will now be considered. Should the main sewer be built of brick, the connection should be



Making Sewer Connections.—Fig. 1.—The Point at Which the House Drain Should Be Connected.

made to it near the top, as shown in Fig. 1, for the reason that the pipe will be well up out of the running water. If it was connected near the bottom the water would back up in the sewer pipe and might possibly be the means of stopping it or flooding the cellar if there was a cellar trap. But if it is a terra cotta sewer a Y connection should be put in on the lower side of the building lot, so that connection can be made to it at any time. The Y should have a slight pitch toward the house. A connection should never be made directly on the top, as it would require a very short turn in the connection and increase the difficulty of clearing with a rod in the event of a stoppage. Into this Y should be connected an eighth bend; usually 6 inches in diameter, as that is the size of the Y generally used in the main sewer. From this eighth bend the drain pipe would be run to the house. The grade would have to depend on the pitch that it might be possible to secure for the house sewer. If the house is on high ground and the drain can be given 1 or more inches to the foot, so much the better, but if it can be given only ¼ inch to the foot it will give good results, as that grade is considered sufficient fall for a sewer pipe.

CONNECTING HOUSE DRAIN TO SEWER.

Every city has its own rules and regulations as to who shall do the tapping and running of the house sewer. Some cities claim the right to carry the sewer as far as the curb line. Others carry the sewer to the point where the iron pipe comes through the front wall. Others again require that the plumber shall tap the sewer and carry the house sewer all the way to completion. But the city employs an official, called a Tap Inspector, who sees that the connection is properly made. The Board of Health then takes the matter in hand and sees that the rest of the work is carried out according to the plumbing code. To my way of thinking it would be a good thing if every city would carry the sewer branches to the curb line. Now in the event of car tracks having to be tunneled under, it makes dangerous work and gives lots of worriment to the plumber. Besides many a poor laborer has lost his life in this way. If the city had this work in charge it could provide and locate such sewer branches and every facility required to perform the work much more readily than the plumber can. A city could, with less expense, provide the lumber and the place to store all the lumber which is required for shoring up the walls of the trench, besides having in its employ men steadily engaged at this kind of work who would become so thoroughly familiar with it that it would always be done in the right way with the best workmanship. I also think that should there be a stoppage in the street it would be better for the city to have that in charge. Furthermore, it would obviate the expense of paying for permits and privileges for opening the street. However, this is only one man's opinion.

THE INTERCEPTING TRAP.

A great deal has been written on the subject of placing a trap at the front wall, some writers contending that it is an absurdity, that it is a filthy contrivance, that it retards the flow of sewerage and that it is the means of stopping up the house sewer, from the fact that it catches the grease and paper, &c. Some claim that where the trap is used a pipe should be run up to the highest point of the building from the outside to relieve the pressure of air from the sewer on the trap in stormy weather and also to help ventilate the main sewer. Others again claim that it is imperative that the main sewer should not exhaust itself through the system of plumbing in a dwelling. Therefore, the use of the intercepting trap is urged on the ground that it intercepts the sewer air or gas by the water seal in the trap. But the fact must not be lost sight of that each and every system of plumbing, no matter how well done, is in itself a small sewer.

THE FRESH AIR INLET.

Therefore, to help make the system as pure as possible, what is called a fresh air inlet must be used. It must be remembered that this pipe has a two-fold office. It both admits air and allows it to pass out, not at one and the same time, but as the case may be. Suppose that there is no water running through the system and that the piping is carried up through the roof, where the air can have free action at the top of the soil pipe vent. This will produce a draft and cause the air to move, and in order for the air to move it must have an inlet as well as an outlet, the fresh air inlet being the inlet and the soil pipe vent the outlet. It can be seen

very readily how this is produced. But, on the other hand, let it be supposed that a big rush of water is let loose down and through the pipes. Then the air which is in the pipes must go somewhere. Since it cannot escape to the sewer, on account of the water seal in the trap, it naturally passes out through the fresh air inlet, inasmuch as there is less resistance in that direction.

The fresh air inlet should never be less than 4 inches in diameter and should be run to some point distant from any window, or so that whatever smell or vitiated air that comes from it could not enter the building. It is difficult to say which is the best place to run it as conditions are not always similar. What would be the best place in one house would possibly be the worst in another. Common sense would readily determine that, but it should be above snow in winter. It should not be carried to the curb and finished with a grate; but, should circumstances compel it to be put there, on account of the house being built on the sidewalk line, it should be brought up about as high as a hitching post, and should be made of extra heavy iron pipe to prevent it from getting broken. It should also be finished with a suitable cap. It is the most absurd thing imaginable to carry a fresh air inlet to the curb line of the sidewalk, finishing it with a grate and allow it to become stopped up with filth. What good is a fresh air inlet when it is stopped up? With apologies to Sieben, I have in mind just what would be the thing for that purpose, but for the present will say nothing about it.

LOCAL REGULATIONS.

If work is done in a city where the Board of Health says "Thou shalt not put in the trap," it would be very foolish to place one in. But, on the other hand, should it be omitted in a city where it is called for it would be equally as foolish to violate the regulation. The plumber has no choice in the matter, but must simply comply with the rules and regulations as laid down. But suppose that the work is not so circumscribed and knowledge is desired as to the necessity of putting in a trap on an operation a plumber may have under way. Should the building or buildings be so situated that there can be no detriment to the health of neighbors, and where there are no windows into which the stench from the top of the pipe could enter, I believe that a plumber would be justified in omitting the trap. But, on the other hand, if these conditions were reversed I would then say by all means use the trap, as a plumber has no right to force the neighbors to take chances on their health in the interest of himself or his customers.

Should there be occasion to use the trap and fresh air inlet perhaps the sketch given in Fig. 2 would be the

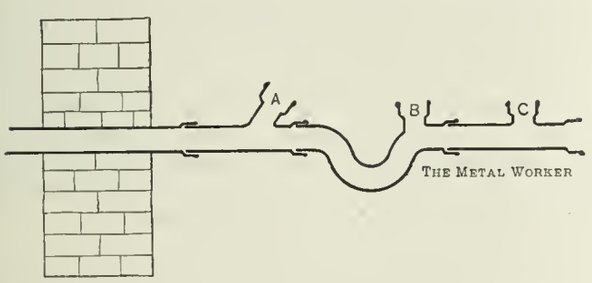


Fig. 2.—The Intercepting Trap, Fresh Air Inlet and Clean Out.

means of making clear the best way to place it. Just inside the wall place a full Y branch, A. Into this Y connect the trap with a hand hole, B. About 2 feet further on connect a tee, C. From this tee take the fresh air inlet. The Y is for the purpose of cleaning the house sewer should it get stopped up. The hand hole, B, is for cleaning the trap, and the reason for taking the fresh air inlet from tee C is that if it was taken from B in very cold weather the water in the trap might freeze from the cold currents of air passing down and over it from the fresh air inlet and so stop up the system.

PROTECTING PIPE FROM SETTLING WALLS.

If extra heavy pipe is used through the wall I don't think there will be any trouble on account of the wall sagging. Still a good plan is to take a piece of pipe larger than the drain pipe and place it in the wall and shove the drain pipe through it. Then thoroughly cement the space between them. Should the ground be of a wet nature it should be asphalted on the outside to prevent the water from working its way through.

If the system of sewerage is large enough to permit connecting the rain water leaders to it, each leader should be trapped separately at the point of connection. Otherwise the leaders will soon rust out from the gases and vapors arising in them, supposing them to be made of tin or galvanized iron. Should they be of copper or cast iron it is advisable to trap them also, for the reason that they may end near a window. If they can be connected they will help to keep the sewer clean by means of the rain water flushing through them. Be sure that the trap at the front wall has a slight fall to the sewer, not enough to affect its seal, but just enough to prevent water from standing in the pipe back of the trap on the house side, so that the greasy water will not collect in it. If this rule is followed out there will not be any trouble with the trap at the front wall.

At another time I hope to describe the various systems I have seen in different cities, how the sewers are run and how flushed, &c.

Death of Edward Baggot.

Edward Baggot, who has long been one of the leading master plumbers and gas fitters of Chicago, died January 23 at his home in that city, aged 68 years. Mr. Baggot was born in Ireland, and came to America when he was 15 years old. Shortly afterward he went to Chicago and was apprenticed to McFarland & Hutchinson to learn the plumbing trade. In 1861 he started in business on his own account and in the short space of ten years reached the distinction of being the leading contractor in that line in the West. This occurred notwithstanding the fact that for some time he neglected his business during service in the civil war as a member of Battery A from Illinois. His store was burned during the great fire of 1871, but before the fire had been completely extinguished he had a shop in operation in a barn located at Taylor street and Centre avenue. He afterward opened a shop at 132 Fifth avenue, moving subsequently to 169 and 171 Adams street, where he was located at the time of his death. Mr. Baggot was a member of the old volunteer fire department of the city. At the time of his death he was a member of the Builders and Traders' Exchange, the Builders' Club, the Chicago Master Plumbers' Association and the Sheridan Club. He leaves a widow and four sons, James E., Joseph M., John D. and George M. Baggot.

The Vance Boiler Works.

The annual meeting of the Vance Boiler Works, Geneva, N. Y., was held on January 20, and the following directors were elected: James R. Vance, B. Borgman, E. M. Winnie, W. S. Moore, J. W. Steck, George W. Goodwin and Samuel F. Myers. The directors elected the following officers: James R. Vance, president; B. Borgman, vice-president and treasurer, and E. M. Winnie, secretary. The reports of the various officers showed the affairs of the company to be in a prosperous condition, with the outlook for the coming year very promising. A new building has been erected at Torrey Park, which the company will occupy about April 1, and already some of the equipment for the new plant is being placed. As a tangible evidence of the prosperity of the concern, a dividend of 6 per cent. on the stock was declared in continuance of an annual custom.

THE plumbing establishment of W. S. Johnston, Willimantic, Conn., was visited by fire last week. The damage done was covered by insurance.

ASSOCIATION NEWS.

Pittsfield, Mass., Plumbers.

The annual meeting of the Master Plumbers' Association of Pittsfield, Mass., was held on Monday night, January 21, when the following officers were elected:

President, Daniel Farrell.

Vice-President, William Milne.

Secretary, D. W. Bovett.

It was voted to petition the City Council to amend the plumbing ordinances, especially those relating to the inspection of work.

Binghamton Master Plumbers.

The annual election of the Master Plumbers' Association of Binghamton, N. Y., was held on January 21, when the following officers were elected:

President, George Cropper.

Vice-President, F. P. Kelly.

Secretary, C. E. Boughton.

Treasurer, William Liddell.

Directors: V. W. Hadley, W. D. McCullough, A. L. Titus, John Hanley and D. J. Malane.

Cleveland Master Plumbers.

The annual meeting of the Master Plumbers' Association of Cleveland, Ohio, was held on January 21, when the following officers were elected:

President, John Leese.

Vice-President, E. H. Benhoff.

Secretary, Eb. Ellen.

Treasurer, Joseph Winterbottom.

Sergeant-at-Arms, Theodore Poplowsky.

The president has announced the following committees:

Arbitration Conference: Chas. E. Armour, A. A. Parker, A. Schneider.

Audit and Finance: Chas. Strever, Henry Mans, Frank Feller.

Entertainment: Eb. Ellen, W. J. Warden, Chas. Siefried, A. Lehman, A. J. Kobs.

Executive: E. H. Benhoff, H. Ward Daykin, Theo. Poplowsky, John Leese, Jos. Winterbottom, Eb. Ellen.

License: E. H. Benhoff, J. B. Couture, L. C. Cooper.

Price-List: East Side, H. J. Luff, Fd. R. Brewer, Theo. Poplowsky; West Side, E. K. Wolf, Richard Kohls.

Resolutions: C. C. Thomas, Horatio Sweesy, John Kelly.

Rules and Legislative: S. W. Burrows, E. E. Hill, B. M. Hallock.

Sanitary: J. B. Couture, Joe Keiper, Frank Hildebrand, R. E. Greene, C. Anderson.

Warehouse: H. Ward Daykin, D. H. Roberts, Louis Poplowsky, A. L. Baeher, Jos. Winterbottom.

Michigan Plumbers.

The master plumbers of St. Joseph and Benton Harbor, Mich., have organized an association and elected the following officers:

President, N. Wagner.

Vice-President, C. A. Taylor.

Secretary, S. T. Cruse.

Treasurer, F. Reich.

The association will meet alternately in St. Joseph and Benton Harbor.

The Best Mfg. Company of Pittsburgh have about finished a very large amount of steam fitting work for Cuba. They have had men working on this contract for several months. They received some time ago a contract for a very large amount of Steam and Gas Piping for the new open hearth steel plant of the St. Clair Steel Company, at Clairton, Pa. They also have some other large contracts and have enough work on hand to keep their large shops busy for several months. They are manufacturers of Valves, Castings, Piping, and make a specialty of Pipe Bending.

PROTECTION IN THE PLUMBING TRADE.

The following contribution on the conditions now existing in the plumbing trade is from one who has had exceptional opportunities of becoming informed on both sides of the question, and who possesses a wide range of experience covering many parts of the country:

I have read with considerable interest your various articles about protection to the plumbing trade, and now have before me your editorial of January 25, 1902. In the various communications sent you, and which you have published, very few have seemed to realize the varied conditions existing in different parts of the country. Each one has seemed, properly enough, to demand protection for himself, but has left to the devil those who follow after.

Make note from whom the bulk of the complaints come. Are they from the cities where the large operations are carried out? The small plumber in the interior town is justly entitled to all protection that can be given, but because he thinks he doesn't get protection on account of a dealer selling a greenhouse keeper a hot water boiler to heat his greenhouse, is he to hold up the entire trade of the country on account of his complaint?

There are rights and wrongs on both sides, and the greatest good to the greatest number should prevail. Allowing that one Western supply house trangressed the rules and sold a few dollars' worth of material to a stove pipe man and consumer, is that any reason why the whole plumbing trade in the country should be held up together with mutual agreements? There is one job under way in New York City at the present time that represents in dollars and cents more than is doing in some States; and is anybody kicking?

Hardwaremen, if competent to install, must have rights in localities where they have in the past been the only plumbers doing business. The writer is conversant with conditions, not only in cities, but in many small towns, where plumbing, steam fitting, tinning and roofing are allied trades, with occasionally a hardwareman doing all of the branches.

New York City Notes.

Among the sufferers from the dynamite explosion in the subway last Monday were Rossman & Braeken, who, although three blocks away and not in a direct line, had their front windows shattered.

* * *

Business is very quiet just at present in all branches of the trade. Many journeymen are out of work on account of new work not being ready and jobbing almost at a standstill.

* * *

On January 29 Morris Sandzik of 790 Second avenue, an unlicensed plumber, was convicted in the Court of Special Sessions of doing plumbing work at 681 Third avenue, on complaint of William Lockwood, clerk of the Master Plumbers' Association. Judge Mayer explained that, while counsel to the Building Department, he helped to frame the law as it stands, and Presiding Judge McKean, in fining the prisoner $25 or 15 days in the City Prison, said he was getting off easily, and that the next offender would get the full penalty.

* * *

There are a few jobs going on where men are hard at work, among them being a ten-story apartment on Eighty-first street and Riverside Drive, where the plumbing is being done by Herman Loden of 214 East Thirty-fifth street for the Moses Taylor Estate, and a ten-story apartment hotel at 124th street and Seventh avenue, to be run in connection with the Harlem Casino, the plumbing in which is being done by William Bryan of 222 East Fiftieth street.

* * *

For a hustling West Side plumber Harry Spencer is getting his share of work. He is now doing apartment houses on Ninety-fourth street, between West End avenue and Riverside Drive; at Ninety-seventh street and the Drive, and in Ninety-sixth street, east of the Drive. T. F. Breen has two apartments in 130th street, west of Amsterdam avenue; L. H. Wenzel has an apartment

house at 218-220 West Eighty-fourth street, and W. J. Fowler of 2157 Seventh avenue has four apartments at Eighth avenue and 149th street.

* * *

The plumbing laws seem to be in favor with the State Legislature at Albany. Another one has been introduced, allowing a certified plumber in one city to do work in any other city of the State, except New York.

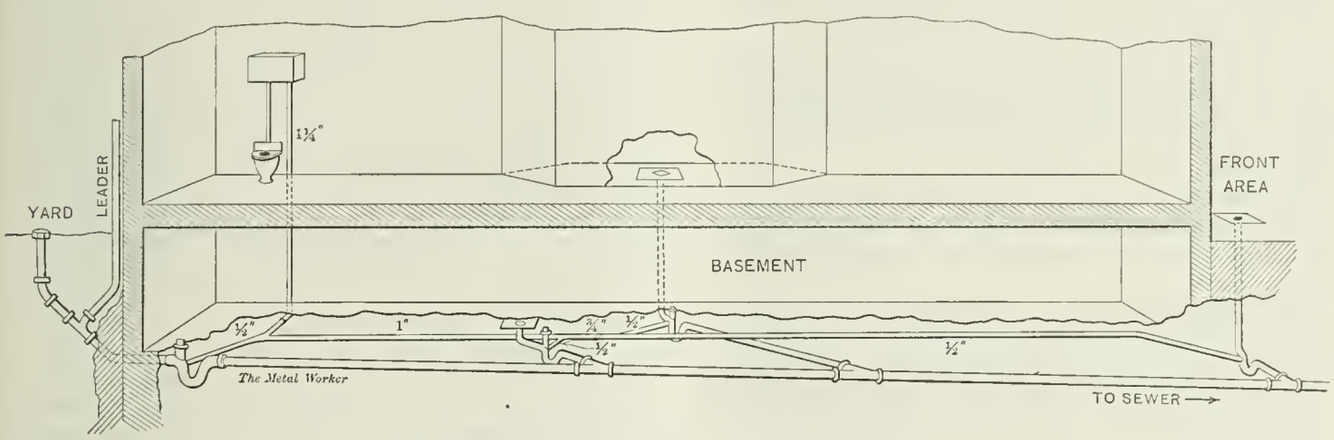
PROTECTING THE SEAL OF AREA AND CELLAR TRAPS.

BY D. F. N.

In the past few years many complaints of disagreeable odors have been made by the tenants of flats, hotels and apartment houses, and in some cases of up to date mansions. This complaint is frequently met with in the daily round of the jobbing plumber. The question is asked: "Where does that offensive odor come from? We seem to get it arising in the light shaft or when we open the door of the dumb waiter, and again sometimes when we open the rear windows." The plumber, of course, suggests the application of a smoke test to locate the defective portion of the drainage system. That is very good, but even if some defect is found and remedied it does not cure the trouble, which will soon return. The plumber, after forcing in a good pressure of smoke, finds the trap for the drain in the bottom of the light shaft has dried out, or the trap for the rear yard drain is under an indirect steam stack on the ceiling in the rear of the basement and is half sealed, emitting foul air.

In some cases the trap for the basement floor in private dwellings has evaporated from the heat of the furnace, and the sewer gas enters the basement and finds its way into the house and into the sleeping apartments above by means of the hot air conducting pipes.

The following method has been devised for overcoming this trouble from the drainage system, and the system of piping applicable to it is shown herewith: All the leaders, courtyard, front area, light shaft and floor drain traps are supplied with water to protect their seal, through the medium of a double compartment flush tank over the servants' closet in private residences, and the same kind of a tank with two corpartments over the janitor's or engineer's closet, as the case might be, in apartment houses and public buildings. One part of the closet tank does service for the closet and the other part connects with a 1¼-inch falling main pipe, having ½-inch branches, to maintain the seal in the different traps. The size of the falling main from the closet tank should be increased if more than a half dozen traps are to be supplied. The traps are drilled and tapped for ½-inch thread below the water seal. The flush and supply can be effected by means of one chain and pull on the tank or by two single levers, or a third lever can be arranged to operate the two single levers at each pull of the closet chain. One part of the tank should be reduced so as not to consume too much water, as very little is required to renew the seal of the traps. Wherever this system has been used all complaint from odors from area drains or light shafts has been stopped. It has only been used on high class buildings, but when its merits is fully appreciated it will doubtless be more widely used.



Protecting the Seal of Area and Cellar Traps.

The P. and S. S. League.

No better evidence is needed of the popularity in the trade of the bowling tournament of the Plumbing and Steam Supply League in New York than the negotiations pending to take up other contests when the present schedule is completed. Already the correspondence with the bowlers in the Boston supply trade has reached a point where the enthusiasts are looking forward to a series of games to be bowled in Boston and New York between selected teams representing the two cities. There is also a strong probability that one or more teams may be entered in a commercial league in New York City.

This week has shown improved scores. The Behrer family team won two games on Monday night, scoring 824, within three pins of the high score, Martin Behrer contributing 201. The Ronalds & Johnson Company team won and lost, W. S. Gibbs supplanting his old high score with 194. The John A. Murray team had just as much fun, if they did lose two games. On Thursday President E. E. Haff led the F. N. Du Bois & Co. team to two victories with scores of 205 and 212, the best evening's work so far in the contests. The Keating team was short one man and lost two games, while the C. S. Locke & Smith team broke even, knocking down 728 pins in one game.

The Standing of the Teams for January.

Teams.	Won.	Lost.	Team score.	Individual score.	Name.
Behrer & Co.	10	2	827	201	M. Behrer.
John Simmons Company	10	2	779	196	W. A. Presby.
Crane Company	8	2	798	210	A. E. Good.
Ronalds & Johnson Company, Brooklyn	7	3	827	198	W. T. Gilmour.
Salesmen	6	4	796	230	Henry Stein.
Central Foundry Company	6	4	701	199	J. S. Dibley.
F. N. Du Bois Company	9	5	776	212	E. E. Haff.
Dimock & Fink Company	7	5	772	194	F. Hogenauer.
C. S. Locke & Smith	5	5	728	193	C. A. Blanchard
Ronalds & Johnson Company, New York	7	7	727	194	W. S. Gibbs.
H. P. Read Lead Works	4	7	689	196	C. V. Driggs.
Fred. Adee & Co.	2	8	695	175	A. B. Kolyer.
John A. Murray	2	10	676	189	G. W. Tilton.
Thomas G. Knight	2	10	675	182	E. E. Benas.
E. F. Keating	1	11	601	185	C. J. McCarthy.

Owing to some unavoidable causes the following changes in the schedule are announced by Secretary Wilson:

Please note that the scheduled games of Thursday, January 30, between the Salesmen, John Simmons & Co. and the Central Foundry Company will be rolled on Monday, February 3. The games scheduled for February 3, between C. S. Locke & Smith, Fred. Adee & Co. and the Crane Company, are postponed and will be

rolled on some date after February 17. In place of the games scheduled for Thursday, January 30, the postponed games of Thursday, January 16, will be rolled between F. N. Du Bois & Co., Edw. F. Keating and C. S. Locke & Smith teams.

Heating and Plumbing Notes.

The State of Texas has instituted suit in the District Court at Austin against D. F. Sullivan and 20 other members of the Master Plumbers' Association of Texas for penalties aggregating $42,900,000, for alleged violations of the anti-trust law. Each of the defendants is sued for $1,950,000 in penalties. Some time ago suit was brought by Attorney-General Bell against a number of members of this association. The defendants confessed judgment, and penalties aggregating several thousand dollars were collected by the State. The defendants in the new suit are members of the association who were not included in the original suit.

The Building Department of Brooklyn, N. Y., has been visited by a delegation from the Brooklyn Master Plumbers' Association with a view to the abolition of the city regulation requiring the use of a patented fresh air inlet device. The delegation also advocated other changes that they claim will enable plumbers to make their work less expensive. Complaint was also made of the delay in the present method of passing plans and against the affidavit with notorial fees to department clerks for plans filed. The complaints and requests were heard and promise was made of investigation with a view to relief.

The Attorney-General of Michigan holds that plumbers who obtain a license from the State Board of Health for one city can pursue their calling in another city by filing such license, without taking out a new license in the second city.

The Smith & Anthony Company of Boston, Mass., bid $12,746 and secured the contract for the heating and ventilating system to be used in the High School at Watertown, N. Y.

The Board of Education of Hamilton, Ohio, will receive bids until February 21 for heating and ventilating the new 12-room school building to be erected in the First Ward in that city. Separate proposals are invited on steam, hot water, hot air and fan systems of heating and ventilating.

George Frelich, chairman of the Almshouse Committee of Schenectady, N. Y., will receive bids until February 17 for heating and ventilating the Almshouse building.

George L. Flanders & Co., plumbers and hardware dealers, of Manchester, N. H., have leased a vacant store in the Boylston Block, to which they will transfer their plumber and hardware business. In their new quarters the concern will be provided with better facilities.

Charles H. Peckham, secretary of the Board of Charities of Rhode Island, will receive bids until February 4 for heating, plumbing, gas fitting and electric wiring the new dining hall, the service and ward buildings and the boiler house at the State Hospital for the Insane, at Howard, R. I.

George J. Allen & Co. have moved into a new store at 14 Sixth street, New Bedford, Mass., where they will make a specialty of heating and plumbing, particularly of fine bathrooms.

L. E. Andrews & Co., Gloucester, Mass., have taken the store adjoining their present business establishment in order to give them increased facilities for their plumbing business.

The strike among the plumbers at Perth Amboy, N. J., has been adjusted by an agreement for an eight-hour day, to go into effect on April 1.

The Department of Public Safety, Baltimore, Md., will receive bids until February 5 for heating two school buildings, one on Walbrook avenue, and the other on Cromwell street.

Charles B. Huck, president of the New York State Association of Master Plumbers, and Secretary H. J. Wood, both of Buffalo, were in Elmira last week making arrangements for the annual convention, to be held in that city March 10-12.

Kelly, Thornton & Williams of Norfolk, Va., bid $9872 and secured the contract for plumbing and heating the new prison in that city.

Prof. S. H. Woodbridge of the Massachusetts Institute of Technology, Boston, Mass., who designed the improved ventilating system of the United States Senate Chamber, is now at work on a similar system for the House of Representatives. He was directly responsible to the Committee on Rules for the work done in the Senate Chamber. For the House work he has been engaged under the general supervision of Elliott Woods. A great engineering change contemplated by the two bodies is the removal of the power and electric plants to a separate building at least 1000 feet distant from the Capitol building, where the exhaust steam which now goes to waste will be utilized for heating.

In a recent issue of the Buffalo *Courier* a half-tone engraving was presented showing a group, the proprietors, engineers and salesmen of the Buffalo Forge Works of Buffalo, N. Y., who devote themselves to the heating and ventilating department of the company's business.

John A. Fish, manager of the Boiler department of the Walker & Pratt Mfg. Company, Boston, Mass., visited among the steam fitters in New York and vicinity last week in the interest of the Walker line of Steam and Hot Water Heaters. These Boilers have many features of merit, and are made in a wide range of sizes adapted to the varied requirements of the heating trade.

The Tube department of the Carnegie Tube Company, Carnegie, Pa., was put into operation last week and this week was operated on a night schedule. The plant will produce Wrought Iron Tubes from ⅛ to 4 inches, and will have a capacity, when in full operation, of 100 tons a day. The officers of the company are: A. G. Hutchinson of New York, president; R. N. Vincent, vice-president; O. G. Grant, treasurer, and T. B. Everson, manager.

The Central Foundry Company of New York City were incorporated January 29, under the laws of the State of New York, with a capital of $100,000.

Sealed bids will be received at the Alamo National Bank, San Antonio, Texas, until February 5, for two elevators, steam heating, plumbing and electric wiring in the five-story bank and office building to be erected at the corner of West Commerce and North Presa streets, San Antonio.

C. E. Hautz, York, Pa., is remodeling the building he recently purchased and will occupy it with his plumbing and tinsmithing business.

Col. F. H. Phipps has decided to install a new heating system at the Watershops, Springfield, Mass., to replace the present antiquated and inadequate service.

Robert Love, for 37 years a resident of Brooklyn, N. Y., died from dropsy on January 27, at his home, 153 Eldred street, at the age of 43 years. Mr. Love was engaged in the plumbing business. He was an active member of the Greene Avenue Presbyterian Church. He is survived by his wife and six children.

The plumbers of Tacoma, Wash., and other cities on the Sound, are reported to be enjoying a harvest of jobs as a result of the recent blizzard.

Rochester, N. Y., is having a lively newspaper controversy over the recent enforcement of the plumbing regulations.

A movement is on foot to organize a society of central station heating engineers.

J. B. Carroll, 36 La Salle street, Chicago, is sending out an illustration of a night scene in winter, calling attention to the fact that on winter nights the lights burn longer and a good Burner asserts itself. This leads up to a consideration of the good points of the Hahn Acetylene Gas Burner. This Burner is manufactured and sold by Mr. Carroll, each part being produced by machinery especially designed for the purpose, and the assembling is done by trained workmen.

The Marcy Mfg. Company, Bluffton, Ind., manufacturers of Red Cross Wind Mills, Pumps, Tanks and Water Works Supplies, held their annual meeting on January 20, when the following officers were elected: President, William C. Elston; vice-president, G. A. Ulmau; secretary, E. V. Livers; treasurer, E. L. Murray, and general mauager, J. A. Ulman. The secretary's report showed a marked increase in the company's business for 1901 over the preceding year, and it was decided to increase their mauufacturing capacity in the near future.

The Putnam Foundry & Machine Company, Putnam, Conn., are sendiug out a notice stating that Wm. McGonigal, formerly local manager for the compauy at Mount Vernon, N. Y., has assumed the business there in his own name, having bought out their intercsts. He is authorized to collect all bills due the compauy, and he will finish all uncompleted work according to the specifications. All bills against the company will be paid from the main office at Putnam, Conn. The notice further says: "We wish him every success, and ask that you give him as loyal support in the future as you have given us in the past. We thank all our past customers and the people of Mount Vernon iu general for the many courtesies shown."

The Prizer-Painter Stove & Heater Company of Reading, Pa., have discontinued the sale of their Heaters iu New York territory through manufacturers' agents and will hereafter maintain a branch office of their own. The new location is at 160 Fifth avenue. The office is under the mauagement of Howard T. Gates, recently of the firm of Jamcs & Gatcs, and formerly New York manager for the Gurney Heater Mfg. Company. Mr. Gates has an extensive acquaintance among heating engineers and contractors, and will be glad to have his many friends inspect his handsome samples and learn why he is so enthusiastic over the Henderson Heaters.

James L. Schaadt, Mayor of Allentown, Pa., will receive bids uutil February 4 for heating two new fire engine company houses in that town.

The plumbing establishment of John W. Hainsworth, Wickford, R. I., was visited by a slight fire last week.

Hanlon Bros., Medina, N. Y., and J. McQuillan, who is interested with them, are doing a fine piece of plumbing in what is said to be the handsomest apartment house in Buffalo, N. Y. There are 100 bathrooms finished in tile with Italian marble trimmings, each equipped with a Standard enamcled bathtub, shower bath and other fixtures with heavily nickel plated trimmings. There will also be a handsomely fitted lavatory in the basement as well as drinking fountains on every floor. The plumbing in the servants' quarters is of equally high grade.

Rollin C. Wilson, 116 Nassau strect, New York, has added to his line of Plumbing Supplies the Champion Enameled Bathtubs, Sinks and Lavatories. Several styles of the Lavatories are on exhibition in his salesroom. He is also handling the fine line of Gas Fixtures and Side Brackets made by the Utica Fixture Company, as well as the Brass Fittings made by that concern.

New Firms and Changes.

The Adams & Jones Company of Boston, Mass., have been incorporated with a capital stock of $25,000, of which $500 has been paid in, for the purpose of manufacturing Heating Apparatus. The officers arc: Harry L. Cram of Portland, president; William F. Gilling, Jr., of Chelsea, Mass., treasurer.

J. A. Walp of Lehighton, Pa., has purchased the interest of Alvin Schaffer in the plumbing and tin business conducted under the firm name of Walp & Schaffer at Weissport.

John N. Martin has purchased the interest of his former associate, A. W. Hiscock, in the plumbing and heating business at Pittsfield, Mass. Mr. Martin has accepted a situation in a Lewiston concern.

Lewis J. Holser has succeeded Joseph Cooper in the plumbing aud steam fitting business on Pike street, Pontiac, Mich.

The Stewart & Bergen Company have been incorporated at Fort Plain, N. Y., with a capital of $15,000, by Archie Stewart, Christian Bergen and Frank Stieht, to deal in Plumbers' Supplies, Hardware aud Agricultural Implements.

Myron H. Richardson has purchased the interest of his former partner, the late Edward D. Lynch, in the long established and prosperous Plumbiug and Hardware firm of Lynch & Richardson, and will continue business alone under the old firm name, at Manchester, N. H.

Oldham & Ranahan are a new firm who succeed William H. Clark iu the tinsmith, plumbing and steam fitting business that he has conducted for the past 20 years at Southbridge, Mass. Mr. Clark retains the Hardware end of the business and will in future devote his entire time to that branch. Both Harry P. Oldham and John S. Ranahan of the new firm are experienced men, having worked for a number of years for Mr. Clark.

R. C. Wilson has purchased the Stove, Tin and Plumbing business of Wilson & Goodspeed at Malone, N. Y., and will coutinue business at the old stand under the name of R. C. Wilson & Co. Mr. Goodspeed of the old firm will remain in the employ of the new firm.

The Plumbers' Supply Company have succeeded the plumbing firm of Henry Fisher & Co. at Hazleton, Pa.

H. F. Garner has opened a tiu and plumbing business at Niagara Falls, South, Canada.

Charles Reidel of Orange, N. J., has purchased the plumbiug business of Walker & Ellam at South Orange, N. J.

Edward D. Sidman, heating engineer and contractor, informs us that he has formed a partnership with C. W. Blauchard and will do a general heating aud plumbing business at 105 William street, Solvay, N. Y.

J. C. Barrett has bought the interests of his partner, W. L. Thomas, in the Washington Plumbing Company, Washington, Pa., and will conduct the busiuess himself.

F. E. Tyler, Albion, N. Y., succeeds to the plumbing business formerly conducted by Tyler & Bennett. The hardwarc branch of the business will be continued by Charles Bennett.

The Pekin Gas Heating & Mfg. Company, Pekin, Ill., have been incorporated with a capital stock of $2400 for the purpose of manufacturing Gas Appliances and installing gas plants. The incorporators are James A. Eddy, Henry Webber and Charles N. Jewett.

The Champion Sanitary Enamel Ware Company have been organized at Blairsville, Pa., with a capital stock of $300,000.

The Western Brass Mfg. Company of Chicago have been incorporated, with a capital stock of $5000, by J. Hadka, Casper Schweitzer and C. D. Baulicek.

Mineral Products of the United States.

Estimates of the mineral products of the United States for 1901, which have just reached the Treasury Bureau of Statistics, indicate that they will exceed in every particular those of any preceding year. In gold, in silver, in iron, in steel, in copper, in coal and in mineral oil the products of the United States in 1901 exceed those of any other country, and in every instance, except possibly copper, surpass her own record in any preceding year. The estimates of gold and silver, pig iron, copper, coal and mineral oil production put the gold production of 1901 at $80,218,800, against $79,171,000 in 1900, which was the highest record in gold production that the United States had ever made. They put the silver production of 1901 at 59,653,788 ounces, against 57,647,000 ouuces in 1900. The pig iron production is estimated at 15,800,000 long tons, against 13,789,242 long tons in 1900, in which year the figures exceeded those of any preceding year. The coal production is estimated at 267,850,000 long tons, against 240,965,917 long tons in 1900, the year of highest production heretofore. Of petroleum the production is estimated at 66,000,000 barrels, or 2,772,000,000 gallons, against 2,661,233,568 gallons in 1900, the year of largest production heretofore. Of copper the production is estimated at 595,000,000 pounds, or 265,625 long tons, or about 5000 tons below the figures of 1900, copper thus being the ouly item in the entire list which shows for 1901 a smaller figure of production than that of last year.

THE LETTER BOX.

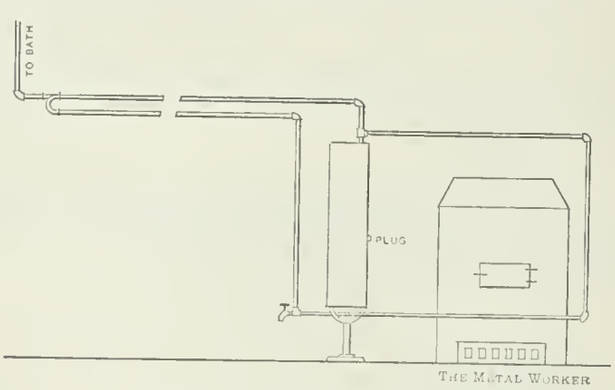
Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

HEATING A BOILER FROM A FURNACE.

From A. R., Oberlin, Ohio.—Please advise me how to connect up a 40-gallon boiler with a hot air furnace. I would like to use in connection with it a circulating pipe to and from the bathroom fixtures. We have a city water supply under a good pressure. The hot water pipe after passing through the furnace must pass up over the top of the furnace before connecting with the boiler. The question is how to make the connection so that the job will circulate. I have drilled through the side of the furnace and run a pipe across the top of the fire pot.

Answer.—The questions presented are treated at some length in the book, "Kitchen Boiler Connections," which can be furnished by our Book Department. In the accompanying illustration we show how the boiler may be connected without any probability of trouble with the circulation if the work is properly done. One-inch iron pipe should be used from the bottom of the boiler through the furnace up over the top of the furnace and connected into the hot water service opening in the top of the boiler. To do this it will be necessary to take out a brass coupling. The service pipe to the bathroom need not be so large, the usual size being sufficient. Many plumbers use for a circulating pipe or



Heating a Boiler from a Furnace.

return pipe one size smaller pipe than the service pipe, in order to reduce the cooling surface exposed. If both pipes are of the same size and are covered benefit will be derived by the use of a larger size of pipe.

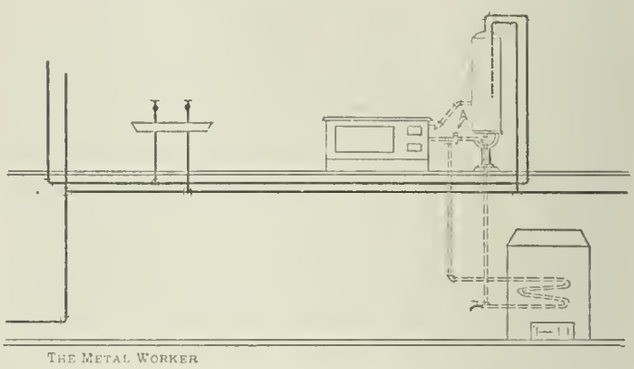
ROOF SWEATS.

From E. Q. R., Frankfort, N. Y.—I have a tin roof on a house that sweats badly in very cold weather. The roof is a steep one, and was originally covered with shingles. The building is in the shape of a T, having three gable ends, and there are windows 12 x 16 inches in size in each gable. In cold weather the roof sweats whether the windows are open or closed. The house is two stories in hight, without any floor in the garret, which is about 10 feet high in the center, running down to the eaves. I shall be glad to learn of a remdy for the sweating.

Note.—Our readers have discussed such problems in the past, and we shall be glad if they will lend their assistance to this correspondent. In the meantime, we would suggest that the sweating, or, properly speaking, the condensation, is due to the roof being cold, and moist air coming in contact with it on the underside leaves moisture in the form of small drops. Where the air is very moist a considerable condensation is likely and may cause annoyance. The best method of overcoming this trouble is to provide the same temperature below that exists above the roof. Under such conditions the moisture in the air will not condense.

COLD WATER FROM BOTH FAUCETS.

From Oliver Twist, Canada.—A few suggestions in regard to the trouble experienced by "I. D. H.," as presented in *The Metal Worker* of January 11, might not be out of place. It might be a disadvantage to have the water circulating through the furnace coil in the summer when the water was being heated by the range. This may be avoided easily by making a kind of by-pass between the bottom of the boiler and the lower connec-



Cold Water from Both Faucets.

tion in the range, leaving the connections to the furnace practically the same as at present, with the exception of having a valve placed between them. This valve would be closed when it was desired to heat the water from the furnace coil, the circulation being the same then as at present. But with the valve open, as it would be when using the range, the furnace would be cut out, because the circulation would be in the direction of the least resistance. This would avoid, with little expense, the cooling consequent on the long travel through the furnace coil when heating from the range. There would be no possible danger from the use of this valve, because, whether open or closed, there would be a way open for circulation. In the sketch herewith the valve is shown at A. The upper connection to range would be better with two 45-degree elbows.

MODEL FOR SMALL FURNACE.

From P. F., Creston, Ohio.—Can you give me any information as to how to make a model for a small furnace, to be cast out of zinc or babbitt metal, or where can I buy a book describing that line of work?

Answer.—Instructions for making a model of a furnace of an unknown kind is a very difficult matter. The making of a cast metal model involves the pattern maker's art and requires the same forms of pieces and cores as will be required in a large furnace. When patterns are made they have only to be molded in sand in the same manner as in molding for brass work, when the pieces may be cast in zinc, babbitt metal or any fusible alloy. We recommend our correspondent to make a study of pattern making in "Hasluck's Pattern Makers' Handy Book, which can be obtained from our Book Department.

PAINT FOR GALVANIZED IRON.

From O'Toole Brothers, Clinton, Mass.—We have waited to hear through your valuable paper more about paints for galvanized iron cornices, &c. We think that we have found a new and efficient method, and as it is just as fine looking to-day as the day it was put on, we are glad to give your readers the benefit of it. We built a three-story building some three years ago and used a large amount of galvanized iron work on the front, in connection with brick work. We let the metal stand some two months after being put on and then gave it two coats of red lead and one coat of U. S. aluminum bronze. This gave it a beautiful silver finish. We have had any number of inquiries from workmen as to what metal it is. The building is on a main business street, in which are three stores and half a dozen tenements, together with a number of offices. We would be glad to furnish a photograph to any one interested in building, showing the large amount of metal and how it looks.

UTILIZING WASTE HEAT.

From A. B. C., Brooklyn, N. Y.—The inquiry of "Southern Plumber," in *The Metal Worker* of December 7, has been very ably answered by "Northern Plumber." Still I think the subject furnishes an excellent example of hot water circulation, which perhaps all do not thoroughly understand. As hot water circulates according to natural laws, in this case, where there is only one continuous course for it to take, the water will circulate provided the mean gravity or density of the water in the ascending column is less than in the descending column. And its circulation will be the more rapid the greater this difference is. The upper radiator, by cooling the water as it descends, accelerates the circulation, while the lower radiator, by cooling the water as it ascends to the heating coil, retards the flow. Consequently, if the upper radiator was larger than the lower one it would tend to make the circulation better, even if it did not give the required amount of heat to the lower room. The best results would be obtained, however, by placing the heating coil as low as possible and then the radiators could be proportioned to properly heat the rooms. While the lower room would require a less amount of heat than the upper one, owing to the window being smaller, the temperature of the radiator would be less than the upper one, and its surface would have to be increased accordingly. Just what this amount would be would depend again upon the rapidity of the circulation, or the loss of temperature the water sustained in passing through the top radiator. While the upper radiator would always heat, if the flow was very slow the water would cool so much in passing through it that little benefit would be had from the lower one.

The amount of heating surface in the coil would be hard to determine unless some idea could be had of the temperature of the gases in the smoke pipe, but at best it would need to be much more proportionally than would be needed in a hot water heater, or if the coil were situated in the fire pot. Provided there is heat enough, a coil in the smoke pipe has the advantage that it can be so arranged with a passby and damper that the heat may be turned around it when the radiators are not used. A coil in the fire pot gives better results, but the heat here used is not entirely waste heat, and it has the disadvantage of always being in use when the fire is kept going, and consequently there is danger of boiling when the radiators are shut off. In this case I think it is desirable to have valves for supplying cold water and drawing off some of the hot water if necessary. Or, better, if the expansion tank is supplied with water through a ball cock there could be a small valve attached to the apparatus, which would open slightly by expansion if the temperature were too high and allow the hot water to flow out.

It has seemed to me that more could be done in regard to utilizing waste heat than is customary in general practice. A kitchen hot water boiler would often heat a small room above it if connected up with a small radiator, as "Northern Plumber" requests. And the heat wasted in the cellar, where it is not needed, by a heater of any kind could generally be conducted to a room above, if the heater were properly cased in and connected with air flues. I believe an upper room could be often very nicely heated if the smoke pipe from a range or heater below was carried up inside a properly constructed hot air flue. Why arrangements of this kind are not oftener used I am at a loss to tell, unless it is that those who pay for the coal used are not fully conversant with these matters, while those who install the work are too busy to study economy for others.

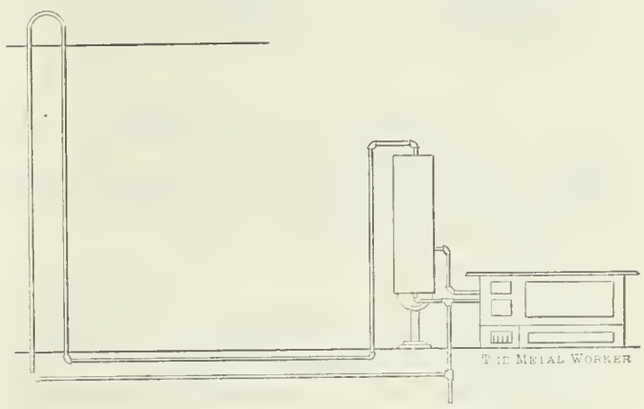
LOCATING REGISTERS AND LENGTH OF PIPES.

From R. M., La Chute Mills, Canada.—I should be glad to hear from the readers of *The Metal Worker* in reference to some questions on furnace work. Is it best to have both hot air and cold air ducts as short as possible? Is it good practice to place a hot air register and cold air register close together, particularly in church heating? I have had a little trouble with one church furnace job in which I think the cold air ducts were too long. The furnace had four 12-inch hot air pipes about 8 feet long, and four 12-inch cold air ducts about 15 feet long connected with registers, all located in the body of the church. I had to locate the registers according to the wishes of the managers of the church, not according to my own views on the subject. I hope that your readers will favor me with their ideas on this subject.

DIP IN PIPING INTERFERES WITH CIRCULATION.

From E. S., Iowa.—Can *The Metal Worker*, or some of its readers, give us some light on the subject of circulation under the conditions presented in the sketch herewith? The hot water pipe runs from the top of the range boiler down under the floor and across 8 or 10 feet, and then rises to the second floor. The return pipe follows the pipe back in the same way, except that it rises and connects with the cold water pipe that goes into the water front. Is there any way to overcome this trap so that the desired circulation will be accomplished?

Note.—We shall be glad if those who have had experience with this character of work will give their views as to how the piping should be arranged to secure



Dip in Piping Interferes with Circulation.

circulation. It would seem that it would be necessary to carry the hot water pipe under the floor boards of the second floor to avoid an air trap and secure a good circulation.

GALVANIZED TINNED SHEETS.

From S. W., North Georgetown, Ohio.—Can small tinned sheets be galvanized, and what is the easiest way to do it without much expense or apparatus?

Answer.—The book, "Galvanizing and Tinning," which can be furnished by our book department, covers this subject on a somewhat larger scale than is mentioned, but a small plant can be readily devised with the assistance of the information given. If the tinned sheets are small it may only be necessary to wash and dry them before they are dipped into the molten zinc, over which there should be a flux of sal ammoniac From the fact that the sheets are tinned already there will be no difficulty in galvanizing them. It will only be necessary that they should be cleaned of any grease or foreign matter before they are dipped into the molten zinc.

George Wright, 121 Fulton street, New York, publisher of Wright's Foreign Trade Directory and Gazetteer, has just issued Wright's Catalogue of America's Greatest Manufacturers in the Engineers' and Metal Trades. The book contains 653 pages, each 13½ x 10½ inches, and is cloth bound. In the front there are a number of striking views of important American buildings and scenes, with accompanying descriptive matter. The balance of the work is made up of advertisements of representative American manufacturers. This book is distributed gratuitously abroad in various quarters of the globe.

TRADE REPORT.

MARKET SUMMARY.

Pig Tin is firmer, but quiet.

Copper has advanced 2c., and is firm and more active.

Pig Lead was marked up 1-10c. per lb.; demand is quiet.

Spelter is quiet and easy.

Antimony is unchanged.

Nickel is firm and without change.

Aluminum is active and unchanged.

Tin Plates are in fair demand at former prices.

Sheets are still scarce and prices unchanged.

Sheet Copper is very active, with prospect of advance in sympathy with Ingot.

Scrap Iron is active and higher.

Scrap Brass and Copper are firmer and moving more freely.

Pig Iron is scarce for spot and strong in price with large demand.

Hardware is moving in good volume, with prices firm as a whole.

Lead Traps and Bends were advanced in price.

Cast Iron Pipe and Fittings are firm, with prospect of an advance.

Nuts were advanced 1-10c. per lb.

Roofing Materials are firm, with active demand.

Washers have been marked up in price.

Conductor Pipe and Eave Trough are strong, with possibility of higher prices.

Wire Nails are firm and in good demand.

Cut Nails are moving in fair volume at unchanged prices.

White Lead is active at former prices.

Linseed Oil is 1c. per gallon higher in price.

Spirits Turpentine has been advanced 1c. a gallon; demand is light.

Old Rubber is quiet and weak.

METAL MARKET.

NEW YORK, January 31, 1902.

Pig Tin.—Since the date of our last report Pig Tin prices receded somewhat until Thursday, when a firmer tone was established in the market, and prices reacted to nearly the level of a week ago. Spot business has been very quiet, consumers buying sparingly. There was, however, more buying in futures, owing to the lower figures made for extended deliveries. Jobbers quote Straits Pig in small lots at 24½c. to 25c. per lb. Arrivals during the month amounted to about 2800 tons, with over 3000 tons afloat.

Copper.—Three sharp advances occurred in the price of Copper during the week, bringing the metal up 2c. above the figures ruling at the date of our last report. The reason for this sharp reaction in the metal is not quite clear, but it is reported in the trade that the New York bull element is at work, and that the principal producers are supplying them with all the metal they want and helping the good work along. The present upward movement, having many speculative signs, is not generally expected to endure for any great length of time. Nevertheless, the market at this writing shows more strength than for some time past, although whether prices will reach a much higher level is a matter of great doubt. Jobbers are now quoting Lake Ingot in small lots at about 13¾c. to 14c. per lb., and Casting Copper at 13¼c. to 13¾c. The rise in Copper values here has been accompanied by a smart upward movement in the London market. It is claimed that a large business was done at the lower figures, for both consumptive and export account. At the close the market was very quiet, so far as new buying was concerned.

Sheet Copper.—The reduction in the price of Sheet Copper to a 16c. basis last week was followed by a great rush of orders, consumers apparently being satisfied that the metal had reached the lowest price at which it was likely to sell for a long time. The manufacturers and dealers were crowded with orders for spot delivery, but refused to accept contracts for future deliveries at the ruling prices. The large increase in the volume of orders prove conclusively that stocks of Sheet Copper in dealers' and consumers' hands throughout the country are very light. The upward reaction in raw Copper this week makes it possible that Sheet Copper prices will also undergo an advance in the near future, should the higher level of prices for Ingot seem likely to hold.

Pig Lead.—An advance of 10c. per 100 lbs. in the price of Pig Lead was made this week by the American Smelting & Refining Company, who also sent a notice to the trade to the effect that, on and after February 12, the quoted figure of the company will apply only to metal bought 15 days in advance of delivery. For strictly spot metal an extra charge is added. This action has been taken in order to induce consumers to buy ahead of their immediate requirements. The demand for Pig Lead is referred to as fair for the season. The market closed steady, jobbers quoting American Pig in small lots at 4.40c. to 4½c. per lb.

Spelter.—The market for Spelter continues quiet and the tone easy, without any change in prices. Good Western brands in small lots are quoted by jobbers at 4⅝c. to 4¾c. per lb.

Sheet Zinc.—There is a fair demand for Sheet Zinc, which is quoted by jobbers at 6¾c. per lb for 600-lb. cask lots and 7¼c. for smaller quantities.

Antimony.—No change is recorded in this market. Hallett's and U. S. in small lots are quoted at 8¼c. to 8¾c. and Cookson's at 10¼c. to 10¾c. per lb.

Nickel.—The market is unchanged, small lots being quoted on the basis of 60c. per lb.

Aluminum.—The demand for Aluminum continues brisk. Prices are without change. Small lots of No. 1 Ingot, guaranteed 99 per cent. pure, are quoted at 37c. per lb. and 100-lb. lots at 35c.

Tin Plates.—The market for Tin Plates is entirely without change, the conditions being as noted in our last report. The larger consumers are covering their wants for the first half of the year and the smaller trade are buying in fair volume on a hand to mouth basis. Prices show no quotable change. American Bessemer Coke Plates, IC, 14 x 20, in small lots, delivered at New York and corresponding points, rule at about $4.85 to $5.10 per box.

Sheets.—The condition of the Sheet market remains fairly strong, the mills all being well filled with orders for the next 60 days or longer. The competition of outside Sheet mills, however, is beginning to tell to some extent on the market, as some lower prices are said to have been accepted in certain quarters on desirable orders. A meeting of Sheet mill men, to be held in Pittsburgh on Monday next, is awaited with a good deal of interest. The matter of a source of supplies for Sheet Bars will be actively taken up. There is some talk of some of the independent mills coming together and building an Open Hearth Steel plant. Prices for small lots of Sheets are unchanged. No. 27 One Pass Cold Rolled Soft Steel Sheets are quoted at about 3.95c. to 4c., and Galvanized Sheets at 67½ and 5 to 70 per cent. off the list.

Chicago advices are as follows: The inducements offered by independent mills are attracting buyers, and a great deal of contracting is being done for future delivery. This business is being stimulated to some extent by the belief that the independent mills will shortly advance their prices. Meanwhile prices made are having

effect on quotations from store at 3.05c. to 3.15c., Chicago, and small lots from store at 3.35c. to 3.45c., but reports of lower store rates are in circulation. Small lots of Galvanized are quoted in a regular way at 70 and 2½ to 70 and 5, but lower prices are also current on this class of Sheets.

St. Louis advices are as follows: A good active trade is being cared for in the market for Sheets of all grades and sizes, and no changes are to be noted in the list of prices. Jobbers quote: Stove Pipe size, No. 27, 3.45c. to 3.50c.; Galvanized Sheets, 65 and 10 off, and in round lots, 70 to 70 and 5 off.

Old Metals.—Scrap Iron is in active demand and prices have stiffened. Scrap Brass and Copper are also moving in better volume, with prices firmer. Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper	per lb. 9½c.
Light and Tinned Copper	per lb. 7¾c.
Heavy Brass	per lb. 7¼c.
Light Brass	per lb. 5¾c.
Lead	per lb. 3¾c.
Tea Lead	per lb. 3½c.
Zinc	per lb. 3 c.
No. 1 Pewter	per lb. 15¾c.
No. 2 Pewter	per lb. 8 c.
Tin Plate Scrap, per gross ton	to $5.00
Wrought Iron Scrap, per gross ton	$11.50 to 12.00
Heavy Cast Scrap, per gross ton	11.00 to 11.50
Stove Plate Scrap, per gross ton	10.00 to 10.50
Burnt Iron, per gross ton	6.00 to 7.00

THE PIG IRON MARKET.

New York.—The market is strong and the feeling is growing that later on there will be considerable trouble about deliveries. Local buyers have again taken fair amounts, the largest purchase being of one lot of 5000 tons by a Pipe foundry. We quote for Northern Irons: No. 1, $17.15 to $17.50; No. 2 X, $16.65 to $17; No. 2 Plain, $16.15 to $16.25; Tennessee and Alabama brands, No. 1 Foundry, $16.25 to $16.75; No. 2 Foundry, $15.75 to $16; No. 1 Soft, $16.25 to $16.75; No. 2 Soft, $15.75 to $16; No. 3 Foundry, $15.25 to $15.50; No. 4 Foundry, $14.75 to $15.

Chicago.—Foundrymen are still buying very freely, both for forward delivery and for quick shipment, wherever a furnace company can be found to make a promise. Spot Pig Iron is in as great demand as ever, showing that many foundries have light stocks. Prices are very strong. Some of the Southern furnace companies are now asking an advance of 50c., while few of them are able to promise anything before July. We quote as follows:

Lake Superior Charcoal	$19.50 to $20.50
Local Coke Foundry, No. 1	16.50 to 17.00
Local Coke Foundry, No. 2	16.00 to 16.50
Local Coke Foundry, No. 3	15.50 to 16.00
Local Scotch, No. 1	16.50 to 17.00
Ohio Strong Softeners, No. 1	19.50 to 20.00
Southern Silvery, according to Silicon.	16.90 to 17.15
Southern Coke, No. 1	16.40 to 16.65
Southern Coke, No. 2	15.65 to 15.90
Southern Coke, No. 3	15.15 to 15.40
Southern Coke, No. 1 Soft	16.40 to 16.65
Southern Coke, No. 2 Soft	15.65 to 15.90

Philadelphia.—Prices are now pretty generally accepted as being on the basis of $17 to $17.50 for No. 2 Foundry for ordinary contracts. Prompt shipments may call for 25c., or even 50c. more, but the demand for deferred deliveries is less urgent than it was earlier in the month. Business in hand has dropped back into its ordinary channels at an established advance during the month of $1 to $1.50 per ton. Further advances, it is believed, will be unadvisable, and the strongest interests are doing their utmost to prevent speculative operations. Low grade Foundry Iron finds a ready market at relatively high prices, but the offerings are unusually light. The range of prices is now as follows for Philadelphia and nearby deliveries: No. 1 X Foundry, $18 to $18.50; No. 2 X Foundry, $17 to $17.75; No. 2 Plain, $16.50 to $16.75.

Pittsburgh.—The situation in Pig Iron is very strong. There have been heavy sales of Foundry Iron for the third quarter and the market for this class of metal is very firm. We quote No. 2 Foundry at $16.50 to $16.75 and No. 1 at $17 to $17.25, f.o.b. cars Pittsburgh.

Cincinnati.—The Pig Iron market continues to show a very considerable degree of activity. There has been quite an amount of business booked for the third quarter of the year and no insignificant tonnage for the last quarter. Agencies here are considering January just closing to be a record breaker, when the field at large is considered. There is no cessation of the complaint regarding car shortage north of the Ohio River. There is not much change in the price-list. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	to $15.25
Southern Coke, No. 2	to 14.75
Southern Coke, No. 3	to 14.25
Southern Coke, No. 4	to 13.75
Southern Coke, No. 1 Soft	to 15.25
Southern Coke, No. 2 Soft	to 14.75
Southern Coke, Gray Forge	to 13.75
Southern Coke, Mottled	to 13.75
Ohio Silvery, No. 1	$16.25 to 16.75
Ohio Silvery, No. 2	15.75 to 16.25
Lake Superior Coke, No. 1	to 17.35
Lake Superior Coke, No. 2	to 16.85
Lake Superior Coke, No. 3	to 16.35

St. Louis.—We can report no changes of note in the Pig Iron situation in this section. Stocks in hand have been gradually getting lower and this week a much smaller available supply is reported. There is no dearth of good orders and inquiries, and a lively trade for immediate delivery would be in progress if only the metal could be supplied. The price-list is without change. We quote as follows for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry	$15.75 to $16.00
Southern, No. 2 Foundry	15.25 to 15.50
Southern, No. 3 Foundry	14.75 to 15.00
Southern, No. 4 Foundry	14.25 to 14.50
No. 1 Soft	15.75 to 16.00
No. 2 Soft	15.25 to 15.50

CHICAGO REPORT.

Scrap Iron and Steel.—The demand is now readily taking all the stock offering. We quote dealers' buying prices for carload lots, Chicago delivery, as follows:

	Per net ton.
Country Wrought Scrap	$11.50 to $12.00
Machinery Cast	11.00 to 11.50
Malleable Cast	10.00 to 11.00
Stove Plate (free from burnt)	8.50 to 9.00
Burnt Iron and Grate Bars	6.00 to 7.00
Sheet Iron and Hoops	6.00 to 7.00
Plow Steel	to 9.00
Breaking Stock	9.00 to 10.00
No. 2, such as Shovels, Hoes, &c	to 7.00
Old Boilers—whole (Iron)	6.50 to 7.00
Old Boilers (Iron) cut in single Sheets and Rings	10.00 to 11.00
Old Gas Pipes and Boiler Tubes	11.00 to 11.50
Cast Borings	5.00 to 5.50
Turnings	10.00 to 10.50
Horseshoes	12.00 to 12.50

Old Metals.—Old Copper and Brass are in strong demand, but dealers are not disposed to sell, believing that prices will be higher. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	9½c.
Copper Bottoms	8¼c.
Copper Clips	9 c.
Red Brass	9 c.
Yellow Brass	7 c.
Red Brass Borings	8½c.
Yellow Brass Borings	6 c.
Light Brass	5¾c.
Pipe Lead	3.50c.
Tea Lead	3.25c.
Zinc	2¾c.
Tin Foil	18 c.
Pewter, No. 1	16 c.
Pewter, No. 2	14 c.
Aluminum	20 c.

Old Rubber.—Very little is doing at present. Dealers' buying prices are as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	42.50	.....
Rubber Shoes	....	6¼c.
Rubber Car Springs	....	5½c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6¾c.
Black Rubber	....	4¼c.
White Rubber	....	8 c.

Rags.—Dealers quote buying prices of good Country Mixed Rags, Chicago delivery, at 75c. to 85c. per 100 lbs. in any quantity.

Anthracite Coal.—Trade is brisk, owing to severe weather. Prices are unchanged, as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis	5.75	6.00
St. Louis	6.20	6.45
Kansas City, Mo	8.25	8.50

THE HARDWARE TRADE.

The good volume of business referred to in our last issue continues. Both manufacturers and dealers are fully occupied. Travelers are generally again on the road, and their activities are resulting in good orders, while their reports very generally reflect an excellent condition of things and predict a large business during the season. The trade are not disposed to buy in a speculative spirit, but are placing liberal orders, and are influenced somewhat by the apprehension of scarcity in certain lines. The general tone of the market is decidedly firm and several advances are reported. There are, at the same time, some concessions on certain lines which come about in connection with a revision of costs and as a result of special circumstances, rather than indicating any weakness in the market as a whole. The condition of the Copper market is having some effect on goods into which this metal enters. Foreign business continues to be, on the whole, in a very satisfactory state. The intelligent efforts which are being constantly made by representative manufacturers to make a place for their goods abroad is little by little resulting in a steady increase in the kinds and volume of goods which go abroad. Many of these efforts are made unobtrusively, and the manufacturers cultivating this class of trade often prefer to do it as a still hunt, rather than with a flourish of trumpets. Much is being done throughout the country in increasing the production of Hardware and related goods, as many manufacturers are enlarging their works. Wages are gradually creeping up, not so much in the way of a general advance as in individual cases. A good many manufacturers refer to the difficulty they have in obtaining skilled workmen. The financial condition is excellent. Collections give little cause for complaint.

NOTES ON PRICES.

Lead Traps and Bends.—The manufacturers of Drawn Lead Traps and Bends have advanced prices. The change took place on Tuesday, January 28, 1902. The best price now quoted by the manufacturers and jobbers to the trade for quantity orders is 55 and 5 per cent. from the lists of June 3, 1901. It is believed that there is no likelihood of any disturbance of prices of this line of goods for some time to come, as all contending interests have been harmonized.

Cast Iron Soil Pipe and Fittings.—The market for this line of supplies has been kept in a satisfactory condition, owing to the mild weather heretofore experienced in the East, which has enabled the trade to continue their work of "roughing" the buildings now in process of construction. Prices among the jobbing trade have been stiffened up within the past week or two in anticipation of an advance by the manufacturers, which, it is rumored, may take place in a short time.

Plumbers' Brass Work.—The manufacturers of Brass Work are decidedly nervous at the present time. The advances in the Copper market this week are responsible for this condition. On Thursday evening the manufacturers withdrew all prices on Brass Work. It looks as though the manufacturers have had enough of low and unprofitable prices and are not anxious to take any risks.

Nuts.—The manufacturers of Cold Punched Nuts and Hot Pressed Nuts have advanced their prices on these goods 1-10 cent per pound.

Tarred Roofing Materials and Building Paper.—The recent combination in these goods has not developed any material effect so far, except an increased firmness in prices and a desire on the part of a considerable portion of the trade to protect themselves against an advance in the immediate future. In the East the market still continues steady, with a good midwinter demand. The desire on the part of those in control to compromise contracts with some of the salesmen rendered supernumerary by the recent absorption of the Union Coal Tar & Chemical Company, Chicago, by the Barrett Mfg. Company and others apparently indicates that the latter interests believe they now control the situation. The market on Tarred Roofing Felts is represented by the following retail prices: $30 to $31 per ton for One-ply, 50 to 55 cents per roll for Two-ply and 70 to 75 cents per roll for Three-ply, although these latter quotations are affected somewhat by the territory to which they go. Rosin Sized Sheathing in less than carloads, delivered, $28 to $30 per ton. Small lots of, say, a ton or so, are quoted: Light Weight, 35 cents per roll; Medium Weight, 47 cents, and Heavy, 58 cents per roll, delivered.

Washers.—Last week an advance was made by the manufacturers in the price of Washers, and the market is now represented by the quotation of 6 cents off list. The demand for this line of goods is large, and some of the factories are behind their orders.

Double Pointed Tacks.—This is a line which does not appear to be characterized by as satisfactory conditions as others. Notwithstanding the large volume of business and the cost of the raw material, prices are low and uneven.

Conductor Pipe, Eave Trough, &c.—The market for this line is regarded by the manufacturers as in excellent condition, and some of them are showing a good deal of conservatism in accepting orders. It is intimated as not unlikely, in view of the condition of the market in the raw material and the large demands the trade are making upon the makers, that prices will be advanced before very long.

White Lead.—A fair business is reported in White Lead in Oil for prompt delivery, while a larger number of orders are being booked for February and March delivery. Reports of concessions of ¼ cent per pound continue. White Lead in Oil, in lots of less than 500 pounds, New York, is quoted at 6½ to 6¾ cents per pound.

Linseed Oil.—The expected advance in the price of Linseed Oil was announced on Thursday. The advance is due to the strong market for seed. There is the usual seasonable distribution of Oil in small lots. Prices are firm at 63 to 64 cents per gallon for City Raw in small lots.

Spirits Turpentine.—Owing to reports from Southern markets Turpentine has advanced 1 cent per gallon during the week. These reports indicate that receipts thus far are running considerably behind last season. The market at this point is quiet, with little Turpentine changing hands, while holders are firm, refusing to sell at lower prices. Turpentine in small lots is quoted at 45 to 45½ cents per gallon.

Old Rubber.—The demand for Old Rubber is light and prices do not show any particular strength. Dealers in New York and vicinity are paying about the following figures:

Car Springs, ton lots, per lb	5¼c.
Rubber Shoes, less than carloads, per lb	6½c.
White Wringer Rolls, per lb	6¾c.
Inside Bicycle Tubing, per lb	21½c.
Outside Tubing, per lb	6¾c.

TRADE NOTES.

The Ideal Brass Foundry have been organized at Saginaw, Mich., by Andrew Murray and Frank J. Maruna. The company will make a specialty of Brass, Bronze and Aluminum Castings.

The Wolf Company, Chambersburg, Pa., will shortly be incorporated for the purpose of operating a plant for the manufacture of Rolling Mill Machinery. H. G. Wolf, J. J. Pollard and J. A. Strite are the incorporators.

As soon as weather will permit, the Lincoln Paint & Color Company will erect a large plant at Lincoln, N. J.

The Kenosha Mfg. Company have started a new enterprise at Kenosha, Wis., turning out Sheet Metal Novelties, Tools and Steel Dies. The prime movers in the company are Hudson F. Blackman and Walter E. Crlstain.

The Memphis Pump Company, Memphis, Tenn., suffered a $20,000 loss by fire at their plant recently. The finishing room, office and recently built tinning room, with entire contents of machinery, finished Pumps, &c., were destroyed.

Plan to Avert Building Strikes

For the last three or four months William H. Sayward, secretary of the National Association of Builders, has been at work in New York City investigating the labor problem as it appears in the building trades of the metropolis. The object of this effort is to secure the co-operation of employers and workmen in the trades named looking toward the establishment of a permanent court of settlement and appeal, in which all of the building trades shall have representation through both employers and workmen, and make annual agreements covering all the rules and conditions which shall prevail in each trade for the year ensuing.

The plan as proposed comprehends such a composition of the court as will give the community its proper consideration, following out the theory that the labor problem is composed of three factors—the employer, the workman and the community—and that no one of these factors or no two have a right to settle conditions conclusively without the co-operation of the others.

Mr. Sayward has thus far been engaged principally in investigation, interviewing a great many employers in all of the building trades individually, making selection of the most influential to determine whether they feel assured that the time is ripe for making a movement of the radical character contemplated, which will be in effect a recognition of the value of co-operation of employers with labor organizations looking to the settlement of all affairs of mutual concern. He has also obtained many interviews with representative workmen and officers of various unions in the building trades to determine whether, on their part, the mass of workmen would be in favor of the establishment of such a court which would place the whole of these relations of employer and workman in a fair way for settlement upon a thoroughly business basis.

He has, thus far, received great encouragement from employers and workmen, they having heartily approved the plan as ideal in character and as being upon a very dignified and businesslike plane. There are many difficulties to overcome owing to the complicated conditions existing in the metropolis which have largely arisen from failure to comprehend the true relations of employer and workman and the value of application of organized effort. There are, however, no difficulties that cannot be overcome by persistent and earnest endeavor along the lines indicated.

Having secured the approval of employers and workmen individually to a sufficient extent to determine the reasonableness of further action, steps are now being taken to obtain the adhesion of the various bodies of employers and workmen. Thus far, too, Mr. Sayward has received the hearty indorsement of such organizations as have been so addressed. He is holding meetings in the city every week and reaching as many organizations as possible, principally, up to the present time, those of employers. All of the organizations of workmen are being addressed through their proper officers, and their adhesion will be sought during the coming months.

The plan briefly outlined is the establishment of a court of settlement and appeal which shall have as its permanent members three persons entirely outside the constituency of the building trades, and to be selected as follows: One by the workmen of all the trades acting collectively, one by the employers of all the trades acting collectively through committees appointed for the purpose, and these two to select a third, also outside the constituency. These three persons are to be preferably men of legal training and judicial character and of such high standing in the community as to lend dignity to the tribunal; they to practically furnish the balance of the court and preserve the community's interest in the conduct of the court's function. These three permanent members of the court form the nucleus. The full court is to be composed by the selection of three workmen and three employers who joined with the three permanent members will make a court of nine. These workmen and employers are to be selected from each trade and to act consecutively in sitting in the interest of that trade in making annual agreements. The three permanent members thus sitting with six representatives of each trade in succession will be able to preserve the decisions from conflict and complication one with another and will from their character lend dignity and significance to the decisions of the court, while at the same time bringing the whole determination of affairs for the building trades upon an infinitely higher plane than they have previously been.

All decisions of the court will be open to the public, and will be conclusive and binding upon all parties. During each year the court will be available for reference in case either employers or workmen in any branch fail to live up to the agreement as announced, the whole to be determined by the court and no strike or lockout of any name or nature be permitted under any circumstances.

Any new features or ideas looking to a change, modification or extension of the rules for any trade during the interim between times of annual agreements are not to be permitted because of abandonment of work but are to be referred to the court for consideration and digestion during the balance of the year, and are to come up for actual consideration at the time of the next yearly agreement.

From the statements above presented it will be seen that this is a radical, yet, at the same time, comprehensive plan, and simple in its principle. It is based entirely upon the idea that it is possible to settle the affairs of mutual concern to employers and workmen, in the building trades at all events, upon lines that are just, fair and businesslike.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED JANUARY 31, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots ..... ₱ D. 37¢
100-D lots..... ₱ D. 35¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 Ds or more.

	6-in.	14-in.	24-in.
Wider than.....	14-in	24-in.	30-in.
And including.....	₱ D	₱ D.	₱ D.
Nos. 13 to 19.....	$0.42	$0.44	$0.47
" 20.....	.44	.46	.49
" 21 to 23	.46	.48	.51
" 24.....	.46	.50	.53
" 25.....	.47	.51	.54
" 26.....	.47	.54	.59
" 27.....	.48	.57	.62
" 28.....	.48	.57	.64
" 29.....	.49	.60	.69
" 30.....	.50	.64	.77

Note.—Lots of less than 50 Ds 5¢ ₱ D extra.

Antimony—

Cookson..... ₱ D. 10¼@10¾¢
Hallett's..... ₱ D. 8¼@8¾¢
U. S..... ₱ D 8 @8½¢

Brass, Roll and Sheet..... 30%

Conductors—
Corrugated.

Round or Square.—
Galvanized ½ or more, N'st'd.....70&5%
" Not Nested.....70&2½%
" Plain Round, ½ or more, Nested..... 70&5%
Galvanized, Plain Round, Not Nested. 70&2½%

Spiral Riveted.

Galvanized 40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—
See *Strainers, Conductor.*

Copper—

Lake Ingot..... 13¾@14 ¢
Casting..... 13¼@13¾¢
Sheet and Bolt.....16¢ ₱ D basis
Cold Rolled Sheets.....17¢ ₱ D basis
Cold Rolled and Polished Sheets..... 18¢ basis
Planished Sheets.....19¢ basis
Bottoms, Pits and Flats....₱ D 20¢ basis

Eave Trough, Galvanized

Territory.	L. C. L.	
Eastern.....	75&10%	Carloads extra 12½%
Central.....	75&7½%	
Southern.....	70&12½%	
S. Western.....	70&10%	

Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—
Eastern List.

Tin..... 30%
Galvanized..... 30%
Perfect Elbows..... 40%

Stove Pipe—

Four-Piece

4	4½	5	5½	6-inch.
No. 1. $0.80	.85	.90	1.00	1.05 per doz.
No. 2. .65	.70	.75	.80	.85 "
No 3. .00	.63	.65	.70	.80 "

Elbows and Shoes—

Galvanized 60%

Gasoline—
See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, C. R., Soft Steel.	R. G. Cleaned.
Nos. 14 to 16....	₱ D. 3.60....	3.65¢
Nos. 18 to 21.....	₱ D. 3 70....	3.75¢
Nos. 22 to 24.....	₱ D. 3.80....	3.85¢
Nos. 25 and 26...	₱ D. 3.90....	3.95¢
No. 27	₱ D. 4 00....	4.05¢
No. 28	₱ D. 4.10....	4.15¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₱ D 11@14 ¢
Do. Stained..... 6@10½¢
Patent Planished. ₱ D A. 12¢; B. 11¢ net

Galvanized.

Nos. 10 to 16.....₱ D, 12¢
Nos. 17 to 21.....₱ D, 13¢
Nos. 22 to 24.....₱ D, 14¢
Nos. 25 to 26.....₱ D, 15¢
No. 27.....₱ D, 16¢
No. 28.....₱ D, 17¢
No. 29.....₱ D, 19¢
No. 30.....₱ D, 21¢
67½&5@67½% off
86 in. 1¢ ₱ D higher.

Lead—

American Pig..... 4.45@4½¢
Bar..... 5@5½¢
Pipe..... 6½¢.....20% off
Tin Lined Pipe..... 12½¢.....20% off
Block Tin Pipe ..... 35 ¢.....20% off
Sheet Lead..... 7½¢.....20% off
Old Lead in exchange, 3½¢ ₱ D.

Mitres, Eave Trough—
See *Eave Trough Mitres.*

Nickel—

Per D..... 60@65¢

Paints, Oils, &c.—
Leads—

Lead, American White, in Oil:
Lots of 500 D or over.....6½ @ 6½
Lots less than 500 D.....6½ @ 6¾
Lead, White, in oil, 25 D tin pails, add to keg price..... @ ¼
Lead, White, in oil, 12½ D tin pails, add to keg price ..... @ 1
Lead, White, in oil, 1 to 5 D assorted tins, add to keg price.. @ 1½
Lead, White, Dry in bbls.....5¾ @ 6
Lead, Red, bbls., ½ bbls. and kegs:
Lots 500 D or over..... @ 6
Lots less than 500 D ..... @ 6½

Oils—

Linseed, City, raw.....₱ gal.....63@64¢
Linseed, City, boiled.....65@66¢
Linseed State and West'n, raw..62@63¢

Spirits Turpentine—

In Southern bbls.....45 @45½¢
In machine bbls.....46 @46½¢

Putty—

In bulk.....$1.25
In bladders..... 2.25
In cans 12 D to 25 D..... 2.25
In cans 1 D to 5 D.... 3.25

Petroleum Products—
In Barrels (Barrel included)

Stove Gasoline.....₱ gal. 11½@11¢
Kerosene..... ₱ gal. 12@13¢

Pipe, Drain..... ....40%

Pipe, Spiral—
See *Conductors.*

Registers—
List Sept. 2, 1901.

Black Japanned.....60&10@60&10&5%
White Japanned.....60&10@60&10&5%
Nickel Plated.....60&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze..... 60&10@60&10&5%
Electroplated in Brass, Bronze or Copper..... ...60&10@60&10&5%
White Porcelain..... .....60%
Solid Brass and Bronze Metal.....50%

Roofing Material—

1 Ply Tarred Paper. ₱ ton. $30.00@31.00
2 Ply Tarred Paper...₱ roll, 108 sq. ft. 50@55¢
3 Ply Tarred Paper..₱ roll, 108 sq. ft. 70@75¢
Slater's Felt.....roll 500 sq. ft., 50@60¢
Roofing Pitch.....₱ bbl. $3.38

Rosin—

Common and Good—Strained.
Rosin, C. & D.....₱ bbl. $1.55 @$1.60
Rosin, E. & F.....₱ bbl. 1.60 @ 1.65
Rosin, G. & H .....₱ bbl. 1.70 @ 1.75
Rosin, I. & K .....₱ bbl. 1.95 @ 2.60
Rosin, M. & N.....₱ bbl. 3.00 @ 3.60

Shoes and Elbows—
See *Elbows and Shoes.*

Slate Roofing—
f. o. b. cars, Quarry Station.

	According to size.
Pennsylvania:	
Best Bangor, ₱ sqr.	$3.25@$4.50
No. 1 Bangor Ribbon, ₱ sq	3.00@ 3.50
Pen Argyle, ₱ sqr.....	3.00@ 3.75
Peaoh Bottom, ₱ sqr.....	4.85@ 5.60
No. 1 Boys, ₱ sqr.....	3.35@ 3.65
No 1 Chapman Keystone. ₱ sqr	3.25@ 4.25
Vermont:	
Sea Green, ₱ sqr.....$2.00@$3.15	
Purple, ₱ sqr	3.75@ 4.25
Unfading Green, ₱ sqr...	3.25@ 4.50
Red, ₱ sqr.	6.50@11.00
Maine:	
Brownville, Unfading Black:	
No. 1 quality.....	$5.25@7.50
No. 2 quality.....	..$4.25@6.00

Solder—

½&½ guaranteed..... 10½@17¢
No. 1..... 14@15½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	Per Pound. Barrels	Smaller Q'ntities
Concentrated Flux.....	4c	5c
Eureka Flux:		
Triple Strength...	8c	8½c
Extra Concentrated.....	4½c	5c
Crystal.....	..	7c
Gedney's Fluid.....	2c	2c
Lennox Fluid.....	2c	3c
Perfection Flux.....	3c	3½@4c
Yager's Salts, 1 lb. bottles.....	each, 50¢	
5 lb. bottles, per lb., 45¢		

Soldering Coppers—

Per D..... 17@18¢

Spelter—

Western Spelter.. .....4½@4¾¢

Spiral Pipe—
See *Conductors.*

Stove Pipe Elbows—
See *Elbows, Stove Pipe.*

Stove Trucks—
See *Trucks, Stove.*

Strainers, Conductor—

Galvanized 50%

Tin Pigs and Bars—

Banca, pigs. ₱ D..... .....24¼@25 ¢
Straits, pigs. ₱ D..... 24½@25 ¢
Straits, in bars. ₱ D..... .....25½@26 ¢

Tin Plates, American Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:
IC, 14 x 20..... ....$7.50
IX, 14 x 20.... . ..... 9.00
IXX, 14 x 20..... ..... 10 25
IXXX, 14 x 20..... 11.50
IXXXX, 14 x 20..... 12.75

Melyn Grade:
IC, 14 x 20..... ..... 7.00
IX, 14 x 20..... ..... 8.50
IXX, 14 x 20..... ..... 9.75
IXXX, 14 x 20 ....11.00
IXXXX 14 x 20.... ..... 12.25

Allaway Grade:
IC, 14 x 20..... .... 6.50
IX, 14 x 20 .... 7.60
IXX, 14 x 20..... .... 8.70
IXXX, 14 x 20..... . 9.80
IXXXX, 14 x 20. .....10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight } IC, 14 x 20.....$5.00@5.25
" IX, 14 x 20.....$6.00@6.25

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:
100 D..... 15¢
95 D..... 20¢
90 D..... 25¢
85 D..... 30¢

Terne Plates—

N. B.—The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance for 8 to 10 D coating and $2.50 to $3 advance for 15 D and upward.

About 40 D coating.. ..... $16.00@16.50
About 30 D coating..... 15.25@15.75
About 20 D coating..... 13.25@13.75
About 15 D coating..... 11.25@11.75
About 8 D coating..... .....@10.00

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $12.50
IXX, 14 x 28..(112 sheets)..... 13.50
IXX, 14 x 31..(112 sheets)..... 15.00

Troughs, Eave—
See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₱ doz... 18.00

Tubes and Tubing—

Brazed Brass, List June 6, 1898 .....40%
Copper and Bronze, 3c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb. 6, 1899
Tin.....50%
Galvanized.....50%
Fittings for do.....40%

Zinc—

600 D casks ₱ D..... .....6¾¢
Per D..... ...7¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
30 gal.....70&10%
35 and 40 gal.....70%
Other sizes up to 52 gal....60@60&10%
52 gal. and above..... .....60%
Extra Heavy Boilers:
18 to 52 gal.....60%
53 gal. and above 55%

Brass Work, Plumbers'—
List of December 7, 1896.

Compression:
Basin Cocks.....00%
Bath Cocks and Double Bath Cocks.. 65%
Bibs. 65%
Bibs, Flanged.....05%
Fuller:
Bibs..... .....70%
Basin Cocks, Nos. 1 to 4..... . ...70%
Bath Cocks, No. 4½..... $2.40 each net
Ground Key Work:
Finished Bibs..... .....55&5%
Rough Bibs and Stops..... 70%
Rough Stop and Stop and Waste Cocks.....70@70&5%
Rough Stop and Stop and Waste Cocks, Patented..... 65@65&5%

Miscellaneous—

Basin Clamps.....60@65%
Basin Plugs.....60@65%
Chain Stays.....60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face..₱ set	$0.95	$1.05
Ground Face ₱ set	$1.00	$1.10

Sink or Bath and Wash Tray Plugs.60@65%
Soldering Nipples.....70&5@75%
Soldering Unions.....70&5@75%
Union Elbows, Hot Water Heating.... 75@75&15%

Cocks, Valves, &c.—
Cocks—
Brass—

Air and Radiator Air .....75@75&5%
Gas Meter and Union Meter.....65@70%
Steam.....65@70%

Iron—

All Iron.....70@70&10%
Iron with Brass Plugs.....65@70%

Valves—
Brass—

Check..... ... 65@70%
Garden Hose..... .....65&10@70%
Gate. ..... 65@65&10%
Globe and Angle, hose outlet.65@65&10%
Globe, Angle and Cross . .65&10@70&5%
Horizontal, Vertical and Angle Check... 65@65&10%
Hot Water Radiator 75%
Radiator.....70&10%
Safety..... .....05%
Safety, Low Pressure..... .....65%
Jenkins' Disc:
Check... .....65%
Gate..... .....65%
Globe, Angle and Cross..... .....70%
Radiator..... .....80%
Radiator, Corner.... ....75%
Safety..... .....65%

Iron—

Iron Body..... .....70@70&5%
Foot..... .....05@70%
Jenkins Bros.':
All Iron, except Gate.....40&5%
All Iron Gate..... .....35@40%
Iron Body, except Gate.....60%
Iron Body Gate..... .....50@50&5%
Swing Check..... ....50%

Earthenware—

Brown Glazed..... .....20%
Porcelain, List of Aug. 15, 1901: Class
Basins, Urinals and Hoppers.... } A, 30%
Closet Bowls, Sundries, Washouts and Pedestals..... } B, 40%
C, 50%

Fittings—
Brass Fittings—

Finished.....70@75%
Rough .....70@75%
Bushings.....70@75%
Nipples.....70@70&2½%
Unions, Rough and Finished....70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....65@70%
Cast Iron Bushings and Plugs.... 65@75%
Cast Iron Flanges..... 65@70%
Cast Iron Floor Flanges.....65@75%
Malleable Iron Fittings..... ...70@75%
" " Bushings.....70@70&10%
" " Unions.....70&10@75%
" " Unions, Flange 60&10@70%
" " Pipe Hangers, Universal 50%
Wrought Iron Nipples.....70@75%
" " Couplings... .....60@65%
" " Long Screws.....60@65%

Lavatories—

Porcelain Enameled Iron.....30@30&10%

Oakum—

Plumbers' Oakum, 50 lb. bales, ₱ D 2½¢

Pipe—
Brass, Iron Pipe Size—

⅛	¼	⅜	¾ to 3 inch
$0.38	.34	.29	.23 ₱ D

Cast Iron Soil—
List Feb. 25, 1901.
2 to 6 inch inclusive.

Standard.....00@60&10%
Extra Heavy..... ...65@70%
All Fittings.....70@75%

Wrought Iron—
List Feb. 15, 1900.

	Black.	Galv.
⅛ to ⅜ inch.....	57%	43%
½ to 12 inch...	64%	51%

NOTE.—*Manufacturers' prices are much lower than above, but prompt shipments are not obtainable.*

Radiators—
Standard List.

Steam.....50&2½%
Hot Water..... .....50%

Sinks, Etc.— Cast Iron—

	Black	Galv.
Sinks, Square, Half Round and Corner..	60@65%	60@65%
Sink Legs. 60%		60@65%
Sink Backs.....	60%	60@65%
Boiler Stands, Cast Iron.....	60@60&10%	
Cesspools, Cast Iron.....		6%

Wrought Steel Sinks—

New Era, Galv'd and Enameled. .. 70&5%
New Era, Painted.....50&10%
L. & G..... ....50%

Traps—

Drawn Lead Traps, List June 3, 1901..... 55@55&5%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns. Guaranteed. 45@50%
All Special Patterns..... ....25%
Non-Guaranteed Brands, complete line ....45@50%
Solid Copper, list of Feb. 1, 1899.....40%
Solid Porcelain—Class A, 30%: B, 40%; C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899.....45@50%

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Giblin & Co., Utica, N. Y.

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Janney, Steinmetz & Co., Phila., Pa.

Aluminum Scrap Buyers.
Janney, Steinmetz & Co., Phila., Pa.

Aluminum Sheets.
Janney, Steinmetz & Co., Phila., Pa.

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Edwards Mfg. Co., Covington, Ky.
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Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, O.

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Foster, F. W. Mfg. Co., Boston, Mass.

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American Blower Co., Detroit, Mich.

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Koven, L. O. & Bro., 50 Cliff St., N. Y.
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Jenkins Bros., 71 John St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

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Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
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Ceilings, Metallic.
Berger Mfg. Co., Canton, O.
Canton Steel Roofing Co., Canton, O.
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Eller, J. H. & Co., Canton, O.
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Laughlin Nail Co., Wheeling, W. Va.
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Kemp, C. M. Mfg. Co., Baltimore, Md.

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Cincinnati Stamping Co., Cincinnati, Ohio.

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National Pipe Bending Co., New Haven, Conn.

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Berger Bros. Co., Philadelphia, Pa.
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Niagara Machine & Tool Works, Buffalo, N. Y.
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Peck, Stow & Wilcox Co., 27 Murray St., New York.
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Garry Iron & Steel Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

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Cooney & Geiger, Indianapolis, Ind.

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Arcade Mfg. Co., Freeport, Ill.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Designs
Vogan, F. M., Canton, O.

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Curtis & Curtis Co., Bridgeport, Ct.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

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Sommer's, John Son, Newark, N. J.

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Energy Elevator Co., Phila., Pa.

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Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Laughlin Nail Co., Wheeling, W. Va.
Marlin & Co., Pittsburgh, Pa.
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Clark Novelty Co., Rochester, N. Y.

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Presbrey Stove Lining Co., Taunton, Mass.
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Clayton & Lambert Mfg. Co., Detroit, Mich.
Wolff, L. Mfg. Co., Chicago, Ill.

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Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Forming Machines.
Pecock, Oliver, Cincinnati, O.

Furnace Cement.
Rutland Fire Clay Co., Rutland, Vt.

Furnace Pipe and Fittings.
International Heater Co., Utica, N. Y.
Osborn, J. M. & L. A., Cleveland, O.

Furnaces and Heaters.
Barstow Stove Co., Providence, R.I.
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Brand Stove Co., Milwaukee, Wis.
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Peck Williamson Co., Cincinnati, O.
Richmond Stove Co., Norwich, Conn.
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Stamford Foundry Co., Stamford, Ct.
Stanton Heater Co., Martins Ferry, O.
Thatcher Furnace Co., 240 Water St., N. Y.
Utica Heater Co., Utica, N. Y.

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Kemp, C. M. Mfg. Co., Baltimore, Md.

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National Enameling & Stamping Co., 78 Beekman St., N. Y.

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Poorman Mfg. Co., Piqua, O.
Wheeler, W. A., Indianapolis, Ind.

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Double Truss Cornice Brake Co., Buffalo, N. Y.

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Millers Falls Co., 28 Warren St., N. Y.

Heat Regulators.
Æolipyle Co., 117 Beekman St., N. Y.
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American Radiator Co., Chicago, Ill.
Barstow Stove Co., Providence, R.I.
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Drake, W. H., Newark, N. J.
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Gurney Heater Mfg. Co., Boston, Mass.
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Seavey Mfg. Co., Boston, Mass.

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Amer. Sheet Steel Co., New York.

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Asheville Mica Co., Asheville, N. C.
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Phila. Machine Tool Co., Phila., Pa.
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Lawless, John H., Jersey City, N. J.

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Cooper & McKee, Brooklyn, N. Y.
Gurney Refrigerator Co., Fond du Lac, Wis

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Dighton Furnace Co., Taunton, Mass.
Illinois Refrigerator Co., Morrison, Ill.
Independent Register Co., Cleveland, Ohio.
Seavey Mfg. Co., Boston, Mass.

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Rutland Fire Clay Co., Rutland, Vt.

Roofing Cork.
Stowell Mfg. Co., Jersey City, N. J.

Roofing Edger.
Danzer Metal Works, Hagerstown, Md.

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Burton, W. J. & Co., Detroit, Mich.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Reeves Mfg. Co., Canal Dover, O.

Roofing Nails.
Salem Nail Co., 279 Pearl St., N. Y.

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Bray, J. & Co., E. Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Genuine Bangor Slate Co., Easton, Pa.
Johnson, E. J. & Co., 38 Park Row, N. Y.
O'Halloran & Jacobs, Pittsburgh, Pa.

Sap Spouts.
Millar, C. & Son Co., Utica, N. Y.

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International Correspondence Schools, Scranton, Pa.

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Harrington & King Perforating Co., Chicago, Ill.

Sewer Pipe.
Rutland Fire Clay Co., Rutland, Vt

Shears, Sheet Metal
McSherry, Chas., Pittsburgh, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y
Keene Geo. C. & Co., Cincinnati, O.

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Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co.. 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Porock, O., Cincinnati, O.
Poorman Mfg. Co., Piqua, O.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Stiles & Parker Press Co.. Brooklyn, N. Y.

Sheets, Corrugated.
Laughlin Nail Co., Wheeling, W. Va.

Sheets, Galvanized.
American Sheet Steel Co.. New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
Laughlin Nail Co., Wheeling, W. Va.
McClure & Co., Pittsburgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Alan Co.. Philadelphia. Pa.

Sheets, Iron and Steel.
American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
Coe, Jas. A. & Co.. Newark, N. J.
Follanshee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co.. Phila., Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Co.. Alan Philadelphia. Pa.

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Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Meurer Bros. Co.. Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.
Colwell Lead Co.. 63 Centre St.. N. Y.

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Canton Steel Roofing Co.. Canton, O.
Drouve, G. Co., Bridgeport, Conn.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co.. 279 Pearl St.. N. Y.

Snow Guards.
Clason Arch. Metal Works, Providence, R. I.

Solder.
Bruce & Cook, 186 to 190 Water St., NY
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co.. Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co.. Philadelohia, Pa.

Speaking Tubes and Whistles.
Ostrander. W. R. & Co.. 204 Fulton St., N. Y.

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Vogel, Wm. & Bros.. Brooklyn, N. Y.

Steam and Gas Fitters' Supplies.
Curtis & Curtis Co.. Bridgeport, Conn.
Walworth Mfg. Co., Boston, Mass.

Steam and Water Engineering and Regulating Specialties.
Kieley & Mueller, 7-11 West 13th St., N. Y.

Steel Shapes.
Cambridge Rolling Mill Co., Cambridge, Ohio.

Steel Stamps and Stencil Dies.
Schwerdtle Stamp Co., Bridgeport, Ct.

Stove Bands.
Kirk Mfg. Co., Toledo, O.

Stove Cement.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Rutland Fire Clay Co., Rutland, Vt.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co.. Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass

Stove and Metal Polish.
Hoffman, Geo. W., Indianapolis, Ind.
Rutland Fire Clay Co., Rutland, Vt.

Stove Patterns.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Milwaukee Pattern Works, Milwaukee, Wis.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
O. K. Mfg. Co, Buffalo, N. Y.

Stove Repairs.
Clark, Henry N. Co., Boston, Mass.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stoves and Ranges.
Arcade Mfg. Co., Freeport, Ill.
Barstow Stove Co.. Providence, R. I.
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Brand Stove Co Milwaukee, Wis.
Champion Steel Range Co.. Cleveland, Ohio.
Detroit Stove Works, Detroit, Mich.
Dighton Furnace Co., Taunton, Mass
Eclipse Stove Co., Mansfield, O.
Enterprise Stove Co.. Vincennes, Ind.
Floyd, Wells & Co.. Royersford, Pa.
Fuller & Warren Co.. Troy, N. Y.
Giblin & Co., Utica, N. Y.
Gurney & Co., Boston, Mass.
Magee Furnace Co.. Boston, Mass.
Quincy Fdry. & Novelty Co., Quincy, Ill.
Richmond Stove Co., Norwich, Conn.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, O.
Sheppard, Isaac A. & Co.. Phila., Pa.
Smith & Anthony Co., Boston, Mass.
Stamford Foundry Co., Stamford, Ct.
Thatcher Furnace Co., 240 Water St., N. Y.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
Adler, H. & Co., Pittsburgh, Pa.
Detroit Stove Works, Detroit, Mich.
Dighton Furnace Co., Taunton, Mass.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
National Vapor Stove & Mfg. Co. Lorain, O.
Ringen Stove Co., St Louis, Mo.
Schneider & Trenkamp Co., Cleveland, O

Street Lamps, Gasolene.
Merkel, H., St. Louis, Mo.

Tank Heaters.
American Radiator Co., Chicago, Ill.

Tanks, Steel and Wood.
Edwards, J. H., 59 Park Place, N. Y.

Terne Plates.
American Tin Plate Co., New York.
Taylor, N. & G. Co., Phila., Pa

Tinners' Tools, Machines and Supplies.
Berger Bros. Co., Phila., Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follanshee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co.. Cincinnati, O.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co.. Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn N. Y.
Welss, H. & Co., 20 Cliff St., N. Y.

Tinners' Trimmings.
Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate.
American Tin Plate Co., New York.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follanshee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

Tin Scrap.
Vulcan Metal Refining Co., 157 Cedar St., N. Y.
Vulcan Western Co., Streator, Ill.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn
Curtis & Curtis Co., Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

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American Distributing Co., Syracuse, N. Y.
Clayton & Lambert Mfg. Co., Detroit, Mich.

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Kirk Mfg. Co., Toledo O.

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Crosby Steam Gage & Valve Co., Boston, Mass.
Jenkins Bros., 71 John St., New York.
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Ventilating Apparatus.
American Blower Co., Detroit, Mich.

Ventilators and Chimney Caps.
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Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Kramer Bros., Dayton, O.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Marston, I. G. & Co., Boston, Mass,

Washing Machines.
Boss Washing Machine Co., Cincinnati, Ohio.
Wayne, Anthony Mfg. Co., Ft. Wayne, Ind.

Water Coolers.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Water Fronts.
Clark, Henry N. Co., Boston, Mass.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.
Miner & Peck Mfg. Co., New Haven, Ct.

Wiping Cloths.
Allbe Chas. A., Springfield, Mass

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Official letters of reference should not be inclosed with replies to advertisements appearing in these columns as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

A first-class PLUMBER; one who is sober and reliable and not afraid of work; steady job to right man; must have first-class reference. Box 553, Newport News, Va. Feb. 1

For a country hardware house, a good, all-around TINNER with some knowledge of plumbing and gas fitting; must be good in figures; a man that can sell hardware, implements, wagons, carriages and sleighs; a steady job for the right man; answer, giving references and name price. The Gallup Hardware Company, Port Allegheny, Pa. Feb. 1

STOVE SALESMAN, with experience, to travel in Iowa; state age, experience and references, and whether married or single. "Stove Salesman," care *The Metal Worker*, 1205 Chemical Building, St. Louis, Mo. Feb. 1

CORNICE CUTTER, young man, one who can draft and cut own patterns. "Copper," care *The Metal Worker*, New York. Feb. 1

A good all around man for village shop; must be able to do general tin and sheet metal work; steady work to the right man. H. C. Seuffert, Caledonia, Minn. Feb. 1

An A1 PLUMBER, STEAM and HOT WATER FITTER; must understand tin and sheet iron work; must be steady and sober; good pay and steady work the year through to the right man. "Hardware," care *The Metal Worker*, New York. Feb. 1

A good all around man for tin shop and in store; one who understands pump work preferred. R. I. Peatman, Centerville, Iowa. Feb. 1

A first-class TINNER for inside and outside work; one that can do some plumbing; must be strictly temperate while about his business; none but a first-class mechanic need apply; to this man we will give steady work. McCombs & Eddy, Connersville, Ind. Feb. 1

SALESMAN, speaking German or French or both, familiar with pipe and fittings line, to travel foreign countries; good position for right man. Box 9, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 1

By March 1, a first-class TINNER and PLUMBER; applicants state full particulars. The Arcata Hardware Company, Arcata, Cal. Feb. 1

A young man, temperate and reliable, JUNIOR PLUMBER, with some knowledge of tin and gutter work; in growing town on Long Island; permanent position if suitable and suited. "B.," care *The Metal Worker*, New York. Feb. 1

An all around TINNER, FURNACE and PUMP MAN; steady work to the right man; best references required with application; must be steady, sober and industrious; permanent work as long as satisfactory. A. E. Pulver & Co., Shortsville, N. Y. Feb. 1

At once, two good CORNICE and SKYLIGHT WORKERS for in and outside work; steady work the year round for the right man. Robert C. Reetz, 19 Dexter street, Pawtucket, R. I. Feb. 1

TINNER; one who understands all kinds of shop work; young married man preferred; good wages to the right party; must be sober, with good references. O. Knisely & Son, New Philadelphia, Ohio. Feb. 1

At once, a good PLUMBER and STEAM FITTER; steady job to a good man. Charles Thomas, Kennett Square, Pa. Jan. 25

An all around TINNER; steady work and good wages to the right man. Herman Soehner, Dayton, Ohio. Jan. 25

A good PLUMBER and TINNER, at once; state wages expected; steady work to good man. Jos. Netzer, Laredo, Texas. Jan. 25

CORNICE MAKER, competent to cut out work, make drawings and estimates; also competent galvanized iron stock tank maker; give reference. Gedge Bros. Iron Roofing Co., Anderson, Ind. Jan. 25

A first-class STOVE PATTERN FITTER; steady employment. "Iron Patterns," care *The Metal Worker*, New York. Jan. 25

TINNER and SLATER at once; must be good workman; steady work. P. H. Bayley, Sidney, Ohio. Jan. 25

A first-class TINSMITH and PLUMBER wanted at once for a country shop; steady job to right man. E. H. Mason, Shingle House, Pa. Jan. 25

SALESMEN, tinners of some experience preferred, to introduce Williams' patent adjustable stove pipe fastener. Lawrence Stamping Works, North Lawrence, N. Y. Jan. 25

A first-class PLUMBER, STEAM and HOT WATER HEATER, also some knowledge of tinning; state wages desired per day. Box 30, Lewisburg, Pa. Jan. 25

A first-class PRESSMAN, one that understands the stamping thoroughly and a good spinner; Germans preferred; can start at once. "M. E.," care *The Metal Worker*, New York. Jan. 25

An experienced SALESMAN visiting the hardware and stove trade for New York and the New England States, to sell a standard line of high grade air tight heaters for wood, as a side line, on commission; only first-class men with experience in this territory need apply; state territory covered. Box 88, Quincy, Ill. Jan. 25

Thoroughly competent FOREMAN for sheet metal shop doing all classes of work, also furnace work; one who can cut his own patterns, lay out the work and handle men to advantage; state experience and wages wanted. "J. B.," care *The Metal Worker*, New York. Jan. 25

A competent FOREMAN on gas machines. The Mitchell Roofing Company, Incorporated, 511 Eleventh street, N. W., Washington, D. C. Jan. 25

TRAVELING SALESMAN, acquainted with roofing, sheet metal, roofers' and tinners' supplies, cornices, steel ceiling and stoves; preferred having personal acquaintance with Michigan trade; best references required. "X. Y. Z.," care *The Metal Worker*, New York. Jan. 25

Three good TINSMITHS who can do inside and outside work, such as cornice, skylight, general jobbing, roofing and whatever belongs to the tinsmiths' trade; steady work for such men; $3 a day. Osmar Poeschel, 610 Spring street, West Hoboken, N. J. Jan. 18

SITUATIONS WANTED.

Experienced MECHANICAL ENGINEER wishes to make connection with building construction company who contemplate installing their own heating plants, engines, pumps, &c., as construction superintendent and engineer; competent man in every detail, temporary or permanent; correspondence solicited. "Blake," first apartment east, 106 West Sixty-first street, New York. Feb. 1

As expert HEATING ENGINEER, 30 years old; can figure up and lay out work for steam and water heating; is thoroughly practical; can handle men; had experience; state salary. "F. P.," care *The Metal Worker*, New York. Feb. 1

Steady position by first-class PLUMBER, HOT WATER and GAS FITTER; 12 years' experience. John J. Kelly, 135 Triangle street, Danbury, Conn. Feb. 1

HORSESHOER, FLOORMAN; can work at fire; city or country. H. McClelland, care O'Hare, 459 West Thirty-fifth street, New York. Feb. 1

First-class PLUMBER and GAS FITTER wants work, city or country; 12 years' experience. J. O'Hare, 459 West Thirty-fifth street, New York. Feb. 1

By first-class TINSMITH, STOVE, RANGE and FURNACE WORKER, steady job at fair wages; can go to work at short notice. "Tinsmith," third floor, 210 West Saratoga street, Baltimore, Md. Feb. 1

A STOVE SALESMAN traveling in New York State would like a first-class line of oil and gasoline stoves to sell as a side line on a liberal commission basis, at once. P. O. Box 159, Central Square, New York. Feb. 1

By a good, practical TIN and SHEET IRON WORKER for in and outside; good bench hand, with 20 years' experience; steady position desired; German; married; please state wages. Geo. Beinkampen, 75 Milne street, Bridgeport, Conn. Feb. 1

A practical heating man would like to handle a house heating boiler in New York or vicinity, or take charge of New York office; had a good trade established; 12 years' experience; or would like to sell boilers for a good house; state salary. "N. F.," care *The Metal Worker*, New York. Feb. 1

As SALESMAN in hardware, tin, stove or furnace house, by young man (24), experienced in retail hardware and have conducted a tin and stove business in Canada; desire to get in with a reliable firm with an opportunity of advancement; best of references. "J. M. A.," 645 Seventeenth street, Detroit, Mich. Feb. 1

A STOVE SALESMAN of 20 years' experience in the South will be open for engagement March 1; reason for change, firm going out of business; best of references. "Stove Salesman," care *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Feb. 1

By a first-class PLUMBER; city or country; can furnish best of references. "R. D.," care *The Metal Worker*, New York. Feb. 1

By a good RAISER, with some experience in cutting cornice; can do heavy sheet iron and copper work. John Berg, 545 Bay street, West Superior, Wis. Feb. 1

A first-class layer out and mechanic at sheet metal work; accustomed to ship work, heating and ventilating by blower system, also general jobbing; wants position as FOREMAN or LAYER OUT; 32 years of age; married and strictly temperate. "A. B.," 310 New street, Philadelphia, Pa. Feb. 1

By a TINNER used to inside and outside jobbing; can do some plumbing and pipe work. Charles Shields, General Delivery, Cleveland, Ohio. Feb. 1

By a man of experience in the stove line and house furnishing goods; is a good salesman on the floor; understands general jobbing in a stove and tinware store; can take full charge of all branches; would make himself generally useful; would start at a low figure; A1 reference. "D. W.," care *The Metal Worker*, New York. Feb. 1

A young man, strictly temperate, honest and reliable, wishes steady position at jobbing; understands plumbing, steam and gas fitting and country work; would like situation in Massachusetts, Connecticut or Eastern New York. G. S. Roberts, care F. Hawkes, 565 East Main street, East Bridgeport, Conn. Feb. 1

Permanent position by a steady, sober and reliable TIN and SHEET IRON WORKER; nine years' experience at in and outside work, iron pipe, windmill and pump work, steam fitting and general jobbing; wages $11 per week for steady position; references if required. "S. G.," Rockville, Conn. Feb. 1

By first-class FOUNDRY and MACHINE FOREMAN; up to date in mining and smelting machinery; fair draftsman; first-class in figures in bidding on machinery plants. J. F. Hampton, Carthage, Mo. Feb. 1

Steady position by a steady, sober and reliable TINSMITH; nine years' experience at in and outside work; roofing, spouting, tinware, furnace work, iron pipe and pump work and steam fitting; will work for $11 per week for steady position; references. "S. G.," Rockville, Conn. Feb. 1

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A steady position by a licensed PLUMBER; fair knowledge of tin and heating; am used to first-class country work; strictly temperate; 30 years of age; good at figuring; moderate salary for steady job. "W. H.," care *The Metal Worker*, New York. Feb. 1

As SALESMAN, by heating engineer, 25 years' experience, to sell furnaces and boilers, also ranges, &c., on salary and commission; A1 references. J. Munns, Box 700, Milford, N. H. Feb. 1

Steam, water or furnace heating SALESMAN and ESTIMATOR; practical mechanic, New York City experience; A1 reference; desires to change position; moderate salary; competent to take charge. "Goss," 160 Bleecker street, New York. Feb. 1

By a first-class PATTERN FITTER and MENDER. "Fitter," care *The Metal Worker*, New York. Feb. 1

A position as TRAVELING SALESMAN with a good hardware or stove house; have made the stove business a specialty the past two years; can furnish first-class reference from present employers; Ohio, Indiana or Illinois preferred. Box 6, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 1

SALESMAN with established trade covering two States, calling on the hardware and tinware trade, wants factory lines to sell on salary or commission. Box 7, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 1

Hustling BOOKKEEPER, OFFICE MAN and CLERK is open for engagement; age 28; first-class habits; if you want a man who will work for his employers' interest. "Bookkeeper," 803 Washington street, Toledo, Ohio. Feb. 1

By a first-class PLUMBER; temperate and best of reference furnished. P. Kelly, 194 Concord street, Brooklyn, N. Y. Jan. 25

By an EXPERT OPERATOR on steam power cornice brake; first-class references; at present employed but desirous of making a change. "Operator," care *The Metal Worker*, New York. Jan. 25

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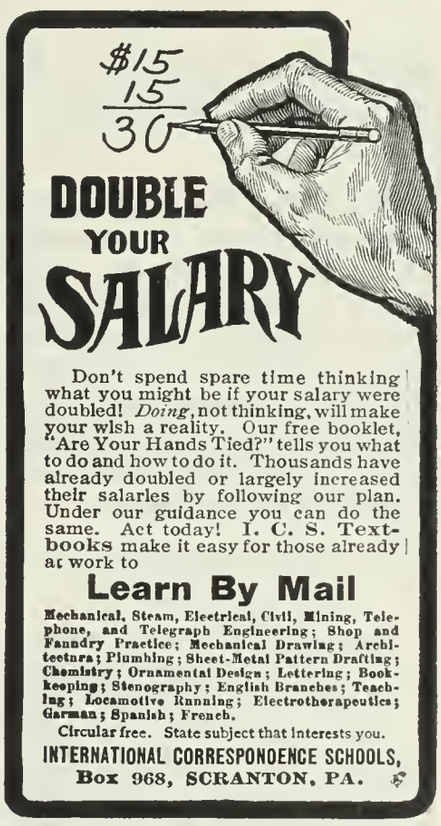
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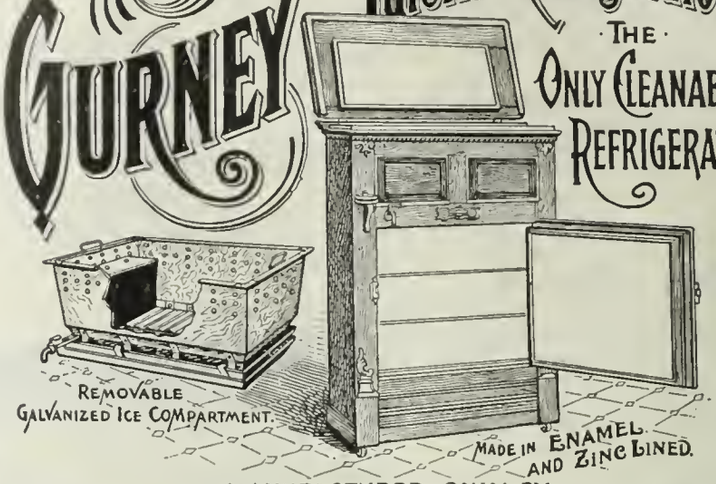
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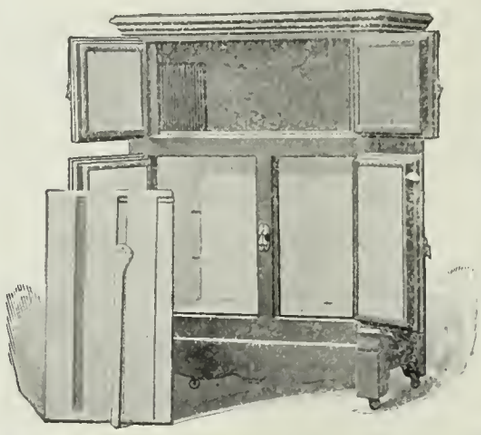
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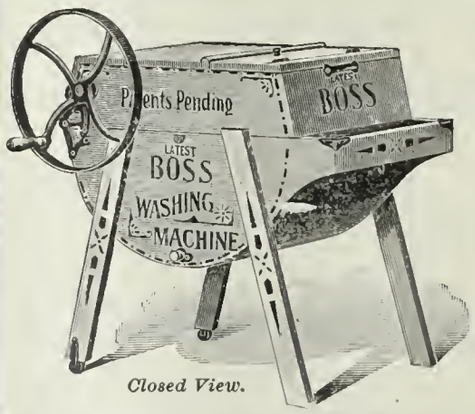
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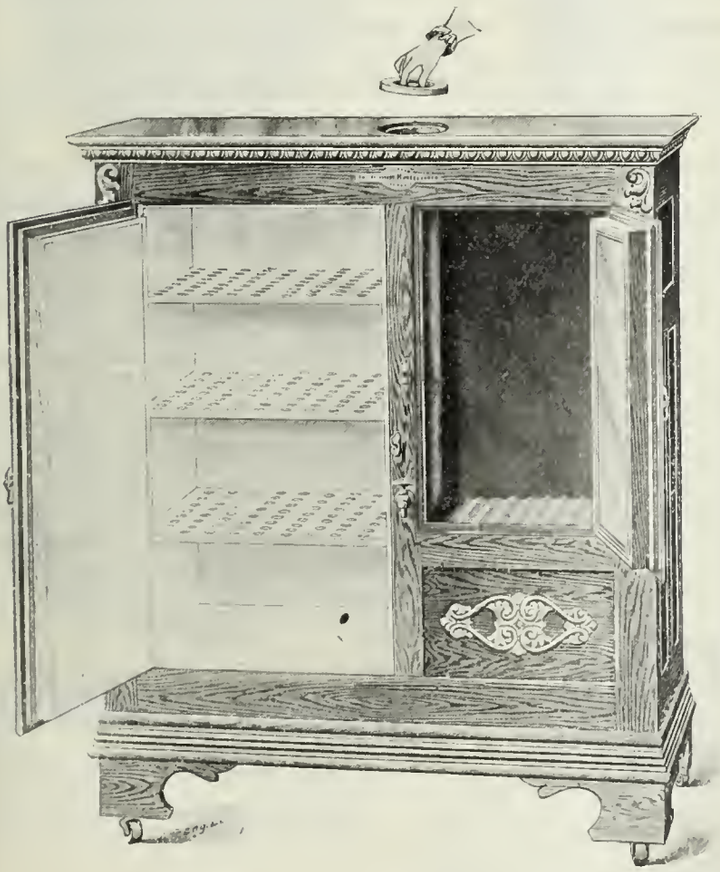
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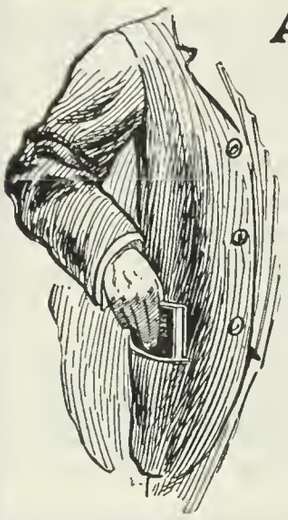
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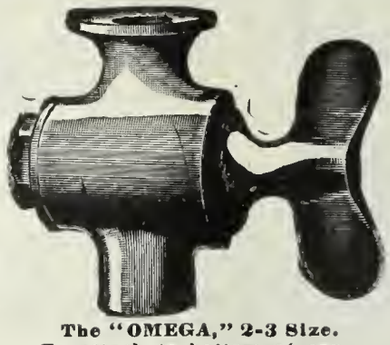
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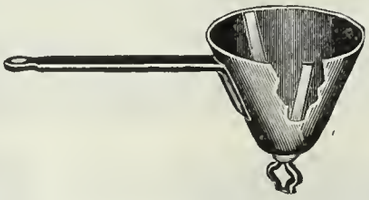
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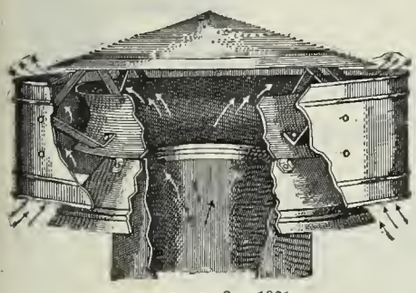
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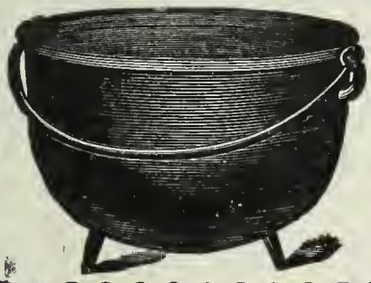
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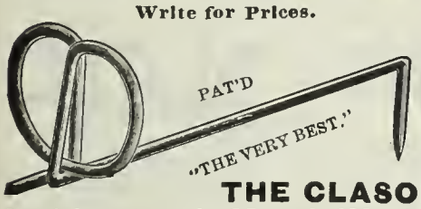
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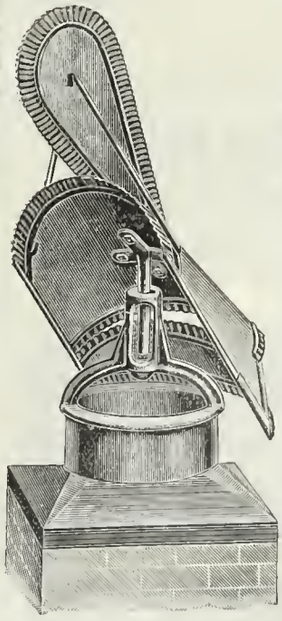
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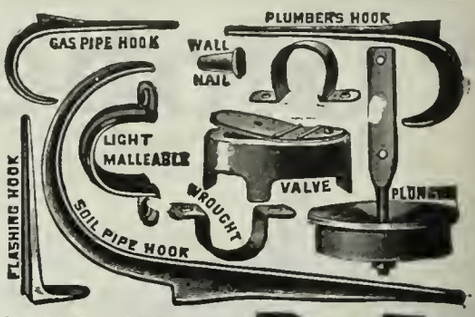
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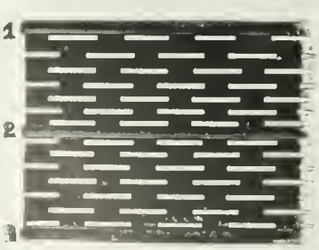
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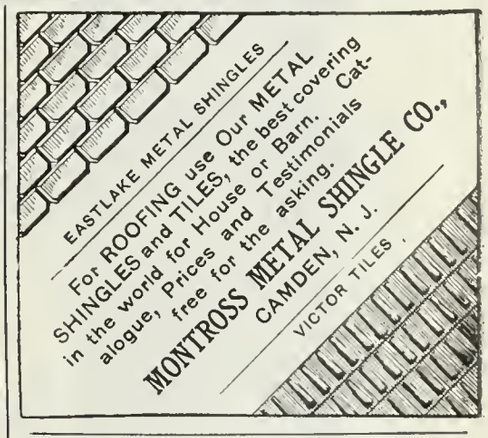
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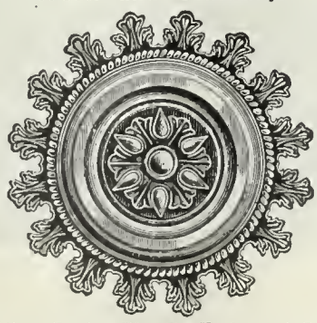




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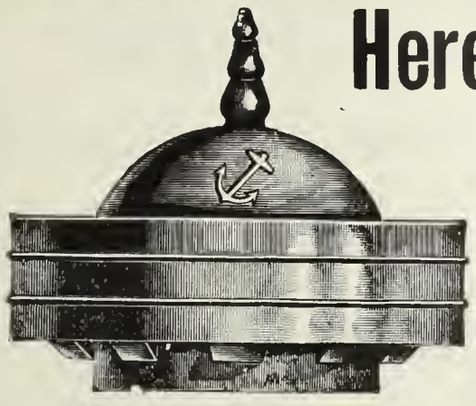
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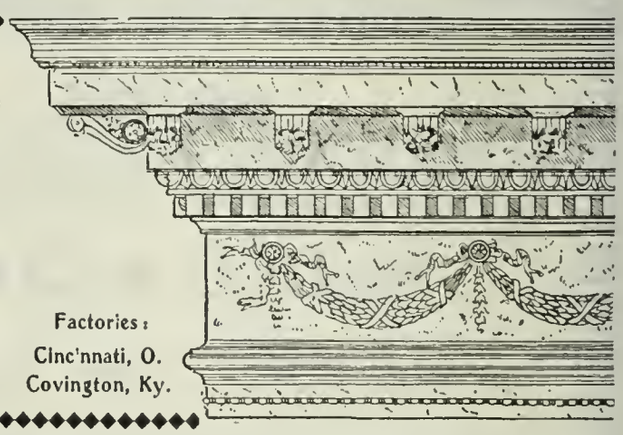
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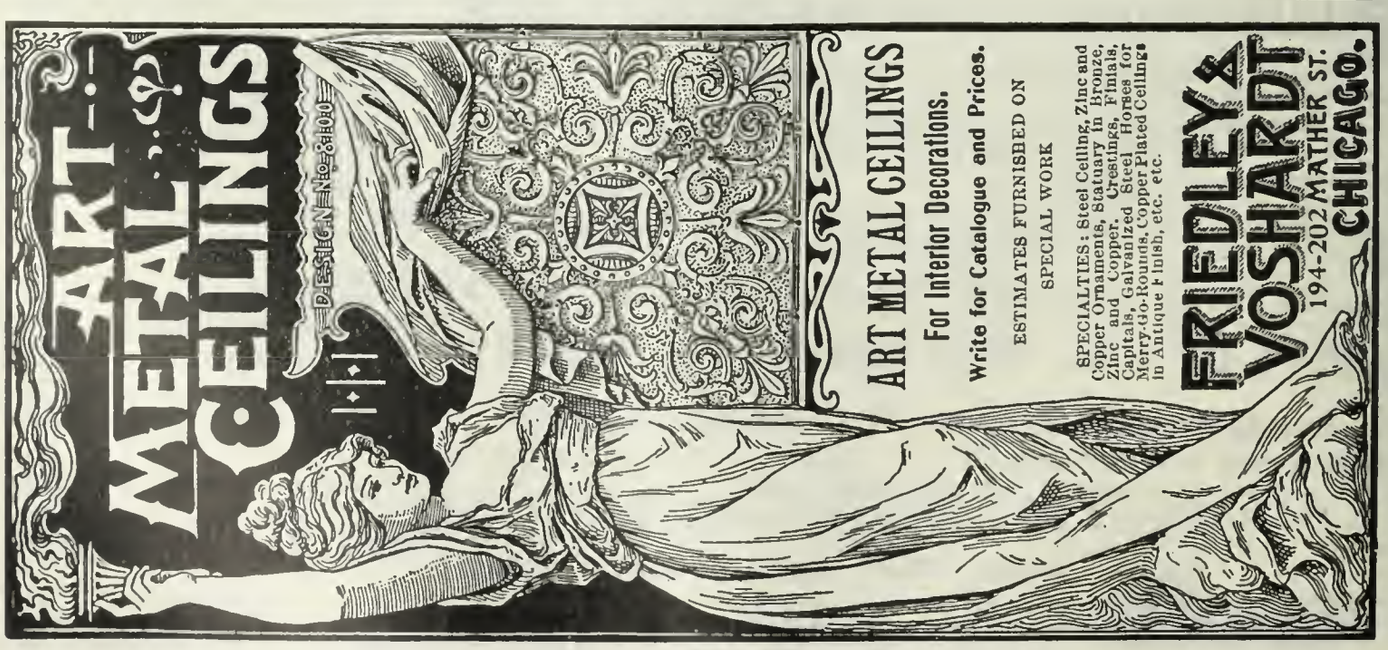
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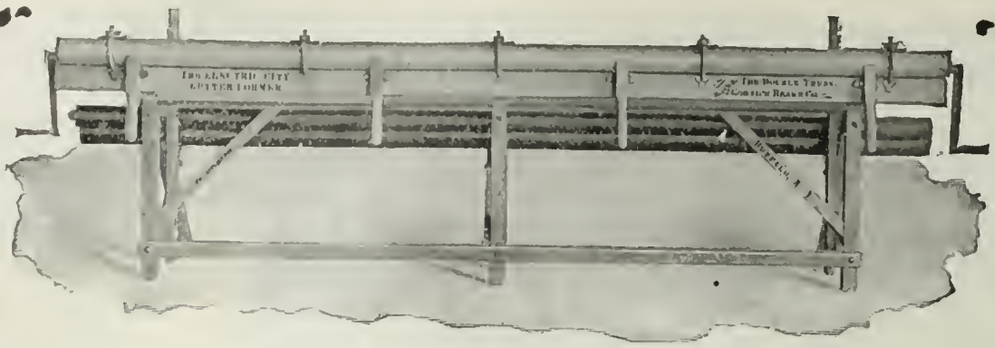
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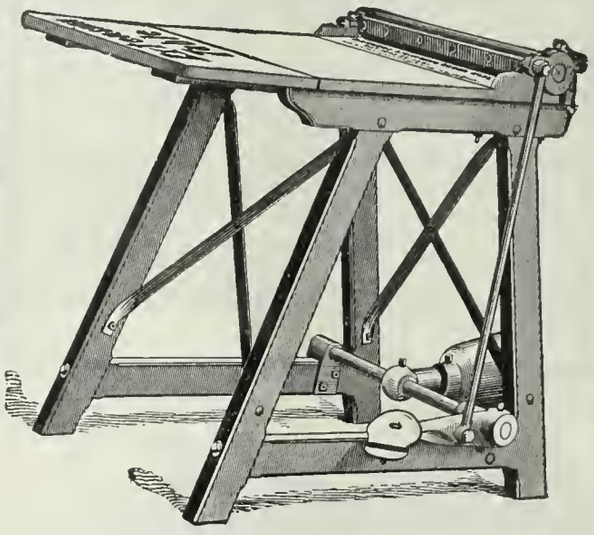
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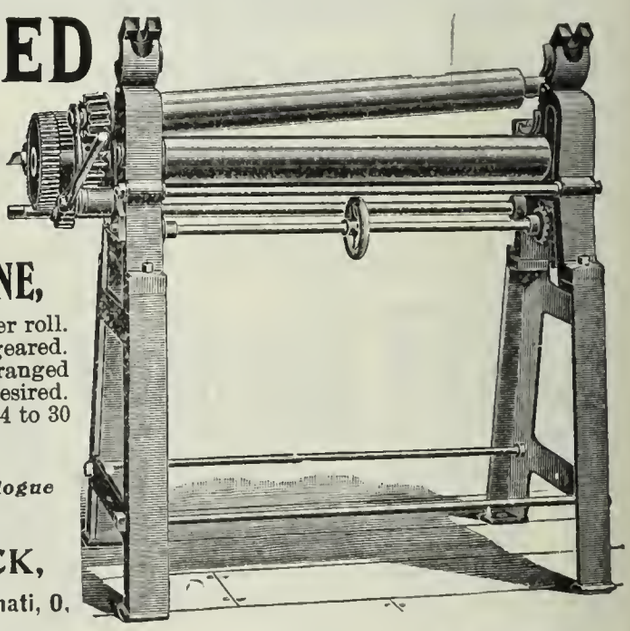
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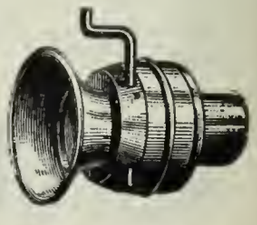


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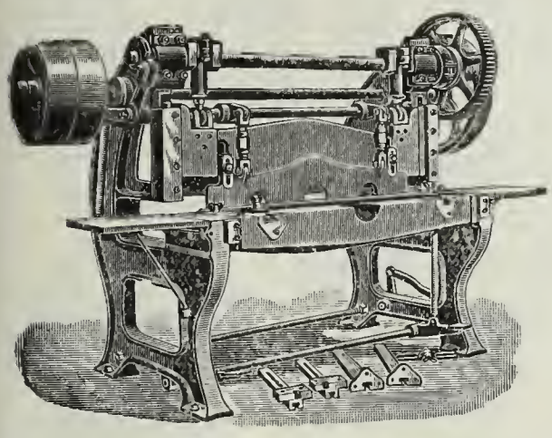
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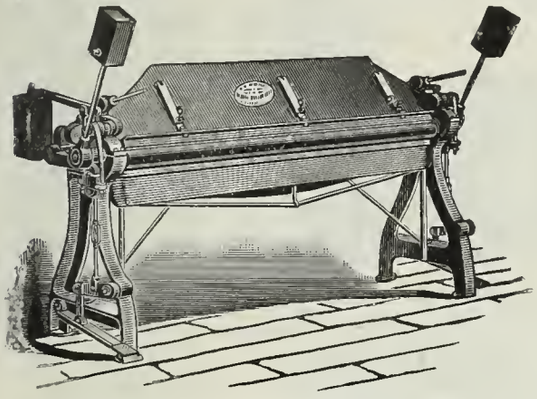
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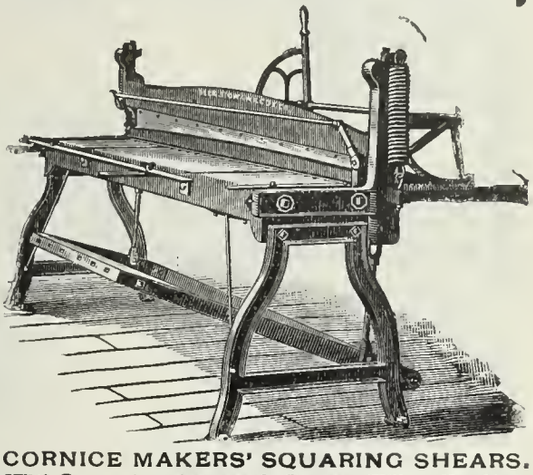
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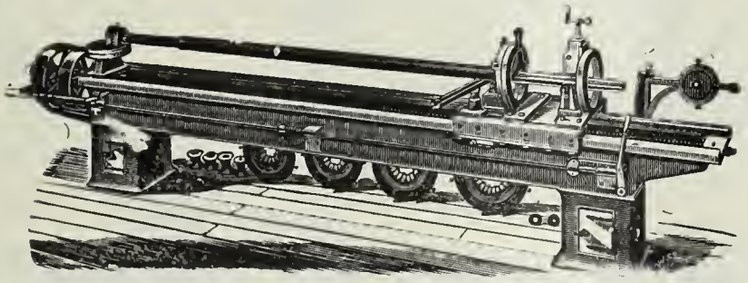
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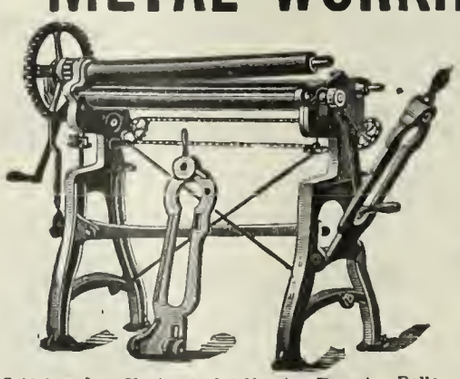
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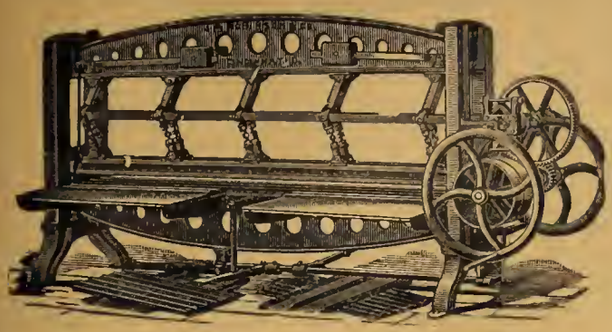
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"Don't say a word, Arthur; I have to get it, because it comes in such lovely enameled tin cans."—*Indianapolis Journal.*

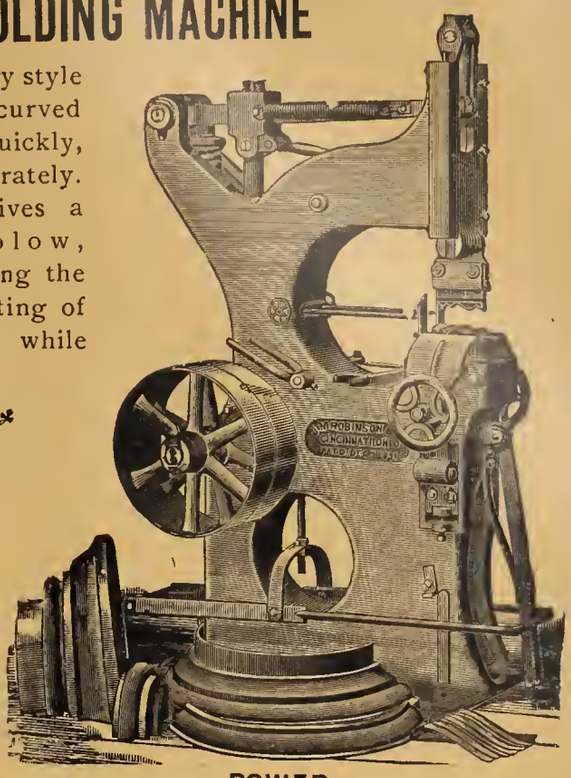


ROOFING AND BENDING MACHINE

With Dies suitable will form Sheet Metal Roofing, Siding, Ceiling, Weather-Boarding, Skylight Bars, Metal Lathing, Gutters, Ridge Caps, Escalloped Steel Sheets and Cattle Troughs. Will bend and form No. 10 gauge and lighter in 6, 8, 10 and 12 foot lengths.

CURVED MOLDING MACHINE

For making every style of sheet metal curved moldings quickly, cheaply and accurately. The hammer gives a perpendicular blow, entirely preventing the drawing or twisting of the material while being formed.



POWER.

The J. M. Robinson Mfg. Co.,

CINCINNATI, OHIO.

Builders of Sheet Metal Working Machinery.

STOVE AND RANGE MAKERS'

Machinery for the Production of Iron Roofing a specialty.

Geo C. Keene & Co,

CINCINNATI, OHIO.

Makers of the Keene Cornice Brake.

Flanging Machine.



THIS SHEAR is made to work by either hand or foot power or both; with hand lever either right or left hand side. Made plain or with gauges. Cuts ¼ in. stock and thinner. Send for circulars of shears and punches if in need.

R. M. CLOUGH,

TOLLAND, CONN.



Combination Shear.

PHILADELPHIA MACHINE TOOL CO.,

445 North Darien St., Phila., Pa.

TESTING MACHINES and *SOLE AGENTS* for HENNING TESTING APPARATUS.

PRESSES and SHEARS, CORNICE PRESSES CURVED MOULDING MACHINES, etc.

HERCULES SHEARS



make the cutting of sheet metal of heavy gauges an easy task for the mechanic and a profitable operation for the employer. With them a man can cut No. 12 steel with one hand on the lever, leaving the other hand free to guide the stock while cutting elbows, ties and circles, as small as 8 inch radius; this is done without burring or buckling either piece, thus avoiding hammering and straightening, which add to the cost of the product. They split sheets of any width or length up to No. 12 gauge, cut wire or bar-steel ⅛ inch thick, cut off and mitre angle iron ⅛ inch thick, and do it perfectly.

WRITE FOR LOWER PRICES.

Manufactured by

CHAS. McSHERRY,

PITTSBURG, PA.

Designer and Builder of Labor Saving Metal Working Machinery and Tools.

EASTERN AGENTS:
Gummey, McFarland & Co., Philadelphia.

WESTERN AGENTS:
Brown & Zortman Machinery Co., Pittsburg.

★ SAWS ★

Our Star Hack Saws are now used in nearly all Iron-working Shops the world over. They are equally useful for farmers and men in all departments of life. They will cut iron and wood equally well. A nail does not dull them at all. One blade, which costs five cents, will cut off an inch square bar of iron 200 times without sharpening. We have cut off such a bar 387 times with one blade. All hardware dealers will furnish these saws. If not, we will send one steel frame and six blades by mail, prepaid, on receipt of $1.00.

All good blades are stamped with a ★

MILLERS FALLS CO., 28 Warren St., N. Y.

TINNERS' TOOLS, MACHINES, and SUPPLIES. Plumbers' Tools, Tinners' Hdwe., Soldering Flux, Salts, Coppers, Rosin, Roofing Cement, Rivets, Bolts, Screws, Slaters' Tools, Second-hand Machinery and **SKYLIGHT GEARING.**

H. WEISS & CO., 20 Cliff St., N. Y.

— CRITICISM WITHHELD.—Hear the new opera the other night? What did you think of it?"

"I don't think a man should express an opinion of a work like that till he's heard it several times, and it's my impression I won't hear it again."—*Philadelphia Record.*

— IT is said that Mr. Evarts was once going up in the elevator at the State Department with many applicants for ministerships and consulships. "Well," said he to a friend, "this is the largest collection for foreign missions that has been taken up in a long time."—*Exchange.*

GRASP TIME



By the forelock and secure the agency for the **New Model Grand** before your competitor gets it. It is as great a bread **winner** as it is a bread baker.

BARSTOW STOVE COMPANY,

BOSTON, 55 Portland St.
PROVIDENCE, R. I.
NEW YORK, Beekman and Water Sts.

SOLDER

We are large importers of Pig Tin from the primary markets and therefore have the advantage in a low first cost. We therefore cannot be undersold on the same proportions.

N. & G. TAYLOR CO.,

MAKERS OF FINE SOLDERS,
PHILADELPHIA.

Lighted by Frink Reflectors.

BROOKLYN INSTITUTE
Of Arts and Sciences.

I. P. FRINK, 551 Pearl St., New York.

L. & R. WISTER & CO.,

Bullitt Building, Philadelphia.

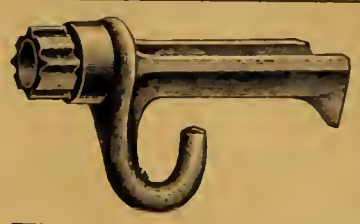
Dunbar Foundry Pig Iron.
Dunbar Connellsville Coke for Foundry Use.
American Sheet Iron Co.'s Sheet Iron.
American R. G., cleaned, of uniform black color.
Dealers in all kinds of Iron and Steel Scrap.

BRUCE & COOK

TINNERS' TOOLS and MACHINES.

TINNERS' SUPPLIES

186, 188 & 190 Water Street, a
248 & 250 Pearl Street,
NEW YORK.



Ideal Sap Spou

Are made open or closed, and a full line of other Maple Sugar goods. Send for dealers' price list.

CHARLES MILLAR & SON CO , Utica, N. Y

HUB RANGES.



HUB RANGES sell quickly because they contain so many exclusive selling features, so sensible and self evident.

HUB RANGES are used and endorsed by all the leading Cooking Schools in New England and New York.

SMITH & ANTHONY CO., - Boston.

Send for Catalogue of Hub Water and Steam Heaters.

Your Future

business success can be measured by the wise or unwise choice of the goods you sell to-day. Hundreds of successful stove merchants sell Glenwood Ranges and Heaters because they always satisfy and invariably make lasting friends.

GLENWOOD

Write the Weir Stove Co., Taunton, Mass.

We Solicit Your Inquiries for

BRIGHT and TERNE PLATE

McCLURE & CO.,

Manufacturers of Tin Plate.

PITTSBURG, PA., 211, 213 and 215 Second Ave.
PHILADELPHIA, PA., 115 North 7th Street.

Index to Reading Matter, Page 53.

Index to Advertisements, Pages 55 - 57.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

Vol. LVII. No. 6. NEW YORK AND CHICAGO, FEBRUARY 8, 1902. ONE DOLLAR A YEAR. SINGLE COPIES 5 CENTS.

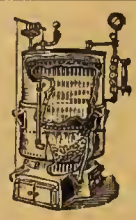
WALWORTH MFG CO. TOOLS and SUPPLIES for STEAM WATER and GAS USERS BOSTON MASS

WALWORTH HEAVY PIPE VISE.



A first-class Tool for General Machine Work. Takes to 6-inch.

BOSTON, 128 Federal Street.
NEW YORK, Park Row Building.



The Gorton Side Feed Boilers

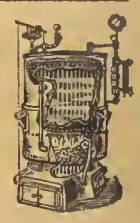
FOR STEAM AND HOT WATER HEATING.

INVESTIGATE FOR YOURSELF.

Send for Catalogue and Prices.

GORTON & LIDGERWOOD CO.,

96 Liberty St., NEW YORK. Old Colony Bldg., CHICAGO.
77 Oliver St., BOSTON. Prudential Bldg., ATLANTA, GA.



STOVE LININGS

McLEOD & HENRY CO.,

TROY, N. Y.

AMERICAN STEAM and ALTITUDE GAUGES, POP SAFETY VALVES.

Hearing Specialties. American Steam Gauge & Valve Mfg. Co., Bismark St., Boston, Mass., U. S. A.

Mr. Charles Hoyt, the playwright, wrote a play about "A Contented Woman." Here is what a contented woman in real life says to the dealer who put in for her a Paragon Furnace and Excelsior Range.

"Your heater and Range have given me great satisfaction and the range is a very good baker. I wish nothing better."

This woman will tell her neighbors about it, too.

ISAAC A. SHEPPARD & CO.

NEW YORK **PHILADELPHIA** **BALTIMORE**

No matter how busy

e are, if you find a hard

uare-inch in Apollo

lvanized iron, we want

know it.

nerican Sheet Steel Company, New York.

A STOVE is a bulky piece of Goods and therefore must move quickly to return a good profit. One sample

P. P. STEWART OAK WOULD BRING YOU LOTS OF ORDERS.

Don't let it go off your floor—so order two.

FULLER & WARREN CO., Troy, N. Y.

This Ad. changes every issue

NOTICE.

Silver, Nickel Platers and Brass Goods Mfrs. MATERIAL FOR DRYING PURPOSES.

Write for prices to John Sommer's Son, 355-365 Central Ave., Newark, N. J.



CROSBY SPRING-SEAT

GLOBE and ANGLE VALVES, IRON and BRASS.

All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.

Crosby Steam Gage & Valve Co.,

BOSTON: 95 Oliver St. NEW YORK: 78 John St. CHICAGO: 21 23 W. Lake St.



FOLLANSBEE BROTHERS CO.,
328-330-332 Second Ave.,
Pittsburgh.
Galvanized and Black Sheets.

The Follansbee Pure Iron Old Style Roofing Tin is meeting with great success, as it is genuine Charcoal Iron Base, and the best made.

Philadelphia, 133 Arch St.
Chicago, 504 N. Water St.
Louisville, 7th and Magnolia.

team Specialties.

LIEF and NOISELESS BACK
EVATOR VALVES, PRESSURE VALVES,
EAM TRAPS, PUMP GOVERNORS,
EAM AND WATER STEAM and OIL SEP-
DUCING VALVES, ARATORS.
NK TEMPERATURE CONTROLLER and
A No. 1 DAMPER REGULATORS

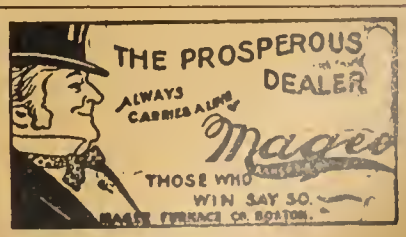
KIELEY AND MUELLER,
17 W. 13th St., - NEW YORK.



Jenkins Bros.' Valves

are manufactured of the best steam metal, and are fully guaranteed. Why experiment with cheap valves? If you want the *BEST* ask your dealer for valves manufactured by Jenkins Brothers. Remember all genuine are stamped with Trade Mark like cut.

JENKINS BROTHERS, New York, Philadelphia, Chicago, Boston,



ROUND OAK STANDARD OF AMERICA



How do these facts strike you?

A merchant cannot stay in business long on "one time" sales. It is the continued business from satisfied customers upon which he must count. There is a certain amount of profit in selling any range whatever, but there is not enough profit to pay him for losing the trade of any good customer. Round Oak Ranges are good ranges to use in the education of a customer. They teach him that you sell the right sort of goods. If you have sold him a Round Oak Range or stove or furnace he will forever after believe in you and your goods.

How do these facts strike you? New catalogue out March 1st.

Estate of

P. D. BECKWITH
Dowagiac, Mich.

MAKERS OF GOOD GOODS ONLY

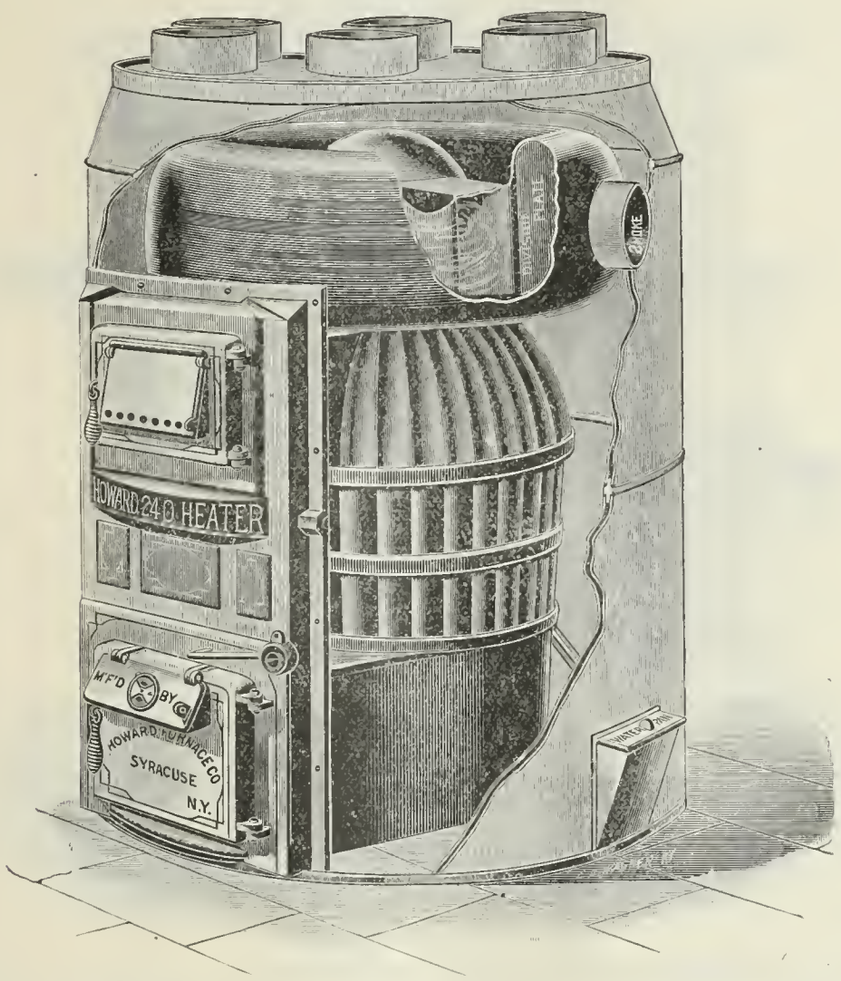
HB CHICAGO

DON'T LAY IT ALL TO POPULAR DEMAND. YOU CAN GET GOOD GOODS IF YOU WILL. ANY MAN CAN SEE THE VALUES IN A HOWARD FURNACE.

THE HOWARD IS DIFFERENT.

Howard Heaters

Are Efficient.



200 Series—All Cast Iron.

The reputation of "The Howard" is established, secure. They have been widely sold, and subject to hard tests. Yet we do not know of a single case where the purchaser has regretted his selection.

THIS IS COLD FACT—THINK IT OVER.

INTERNATIONAL HEATER CO., Utica, N. Y.

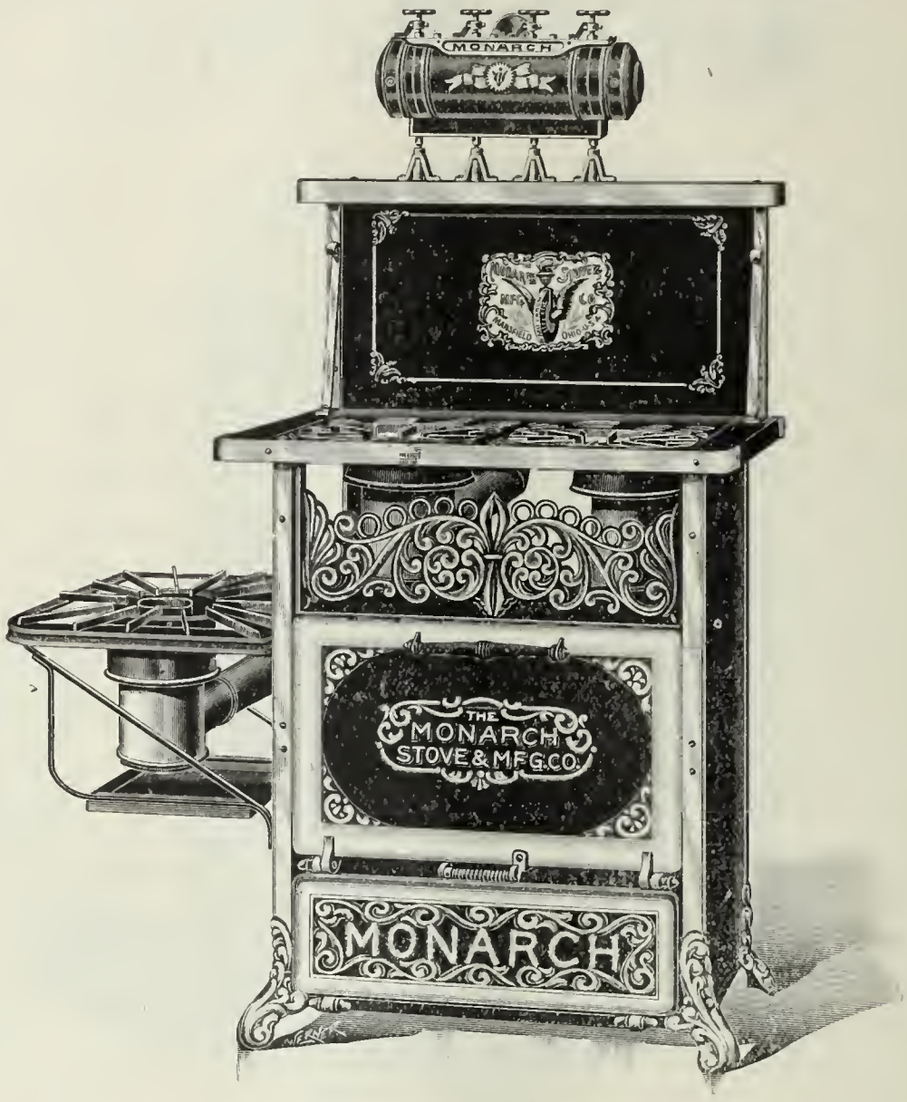
BOSTON, NEW YORK, CHICAGO, DENVER.

THE LARGEST MAKERS OF HEATERS IN THE WORLD.

The MONARCH Line for 1902.

NOW READY FOR BUSINESS.

New Catalogue is a Beauty. *Did you get a copy?*



The Three Distinct Features on "MONARCH" goods are—

FIRST—Striking Originality and Distinctiveness of Features.
SECOND—Highest Grade Workmanship.
THIRD—Attractive and Artistic Design and Finish.

ANY ONE OF THESE THREE POINTS WILL PRODUCE PROFITS.

THE MONARCH STOVE & MFG. CO., Mansfield, O.

—— BRANCHES ——

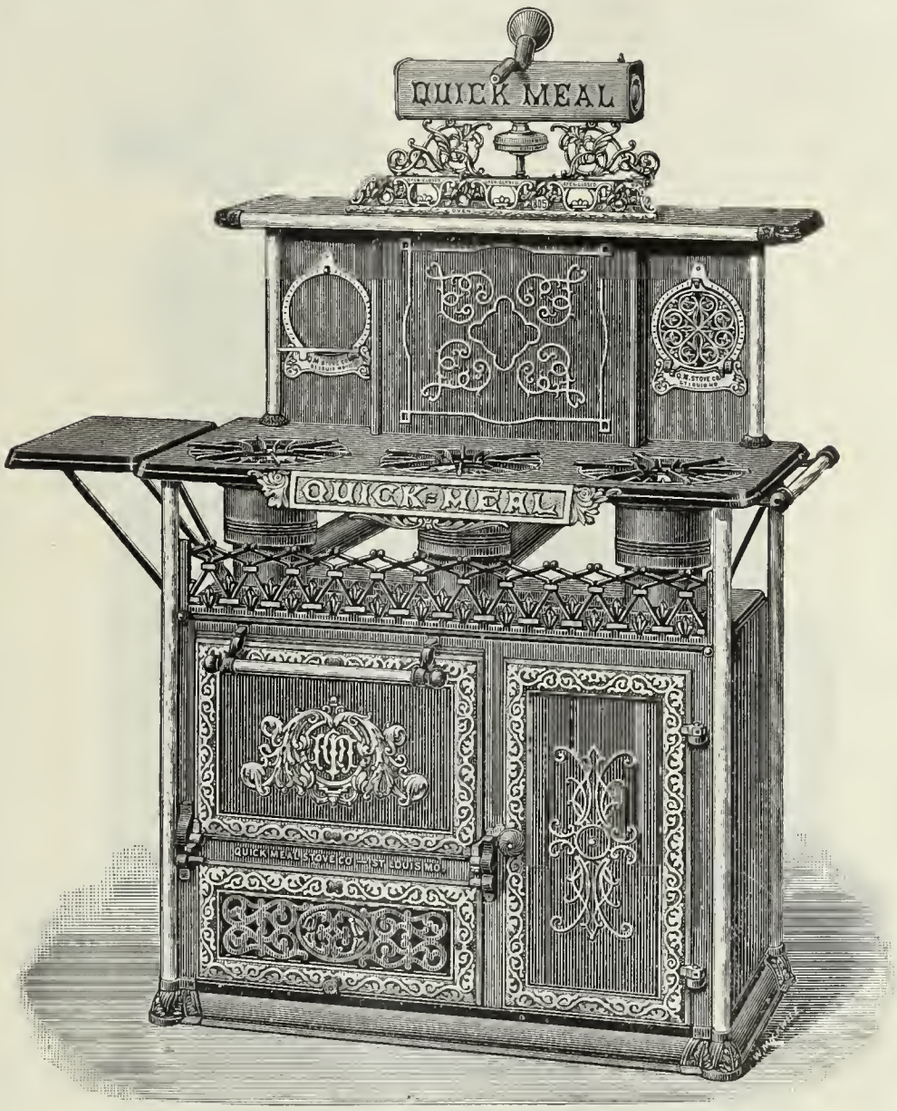
284-6 PEARL ST., NEW YORK. 107 N. 2d ST., PHILA. 203 WOOD ST., PITTSBURG.
67 LAKE ST., CHICAGO. 191 EAGLE ST., ST. PAUL, MINN.

H. R. Bruce & Co., Cincinnati, Ohio. Central Supply Co., Des Moines, Iowa. Newby Stove Repair Co., Kansas City, Mo. Bartlett and Norris, Lincoln, Neb. W. H. Gruenhagen, St. Paul, Minn. M. F. Stellwagen, in Wisconsin. Kellogg & Stokes Stove Co., Denver, Colo. R. P. Smith, Houston, Texas.

The trade in the various States covered by these Branches and Representatives will be given the very best service possible and their interests receive the most careful attention.

Have you a copy of the Catalogue? If not drop a postal to any of the above and it will come on the jump.

QUICK MEAL



We wish to call special attention to our line of **Cabinet "QUICK MEAL" Evaporating Gasoline Ranges.** We make the largest line of **Evaporating Stoves** made. These stoves have been thoroughly tried and have proved both satisfactory and durable. The **"QUICK MEAL" Evaporating Stoves** have stood the **severest tests,** and stand to-day the unrivaled leader of all Evaporating Stoves made.

Our line of **"QUICK MEAL" Stoves** for 1900 will be more complete than ever; both in **Gasoline** and **Blue Flame Oil Stoves.** They are perfect in design, perfect in workmanship, and perfect in assortment.

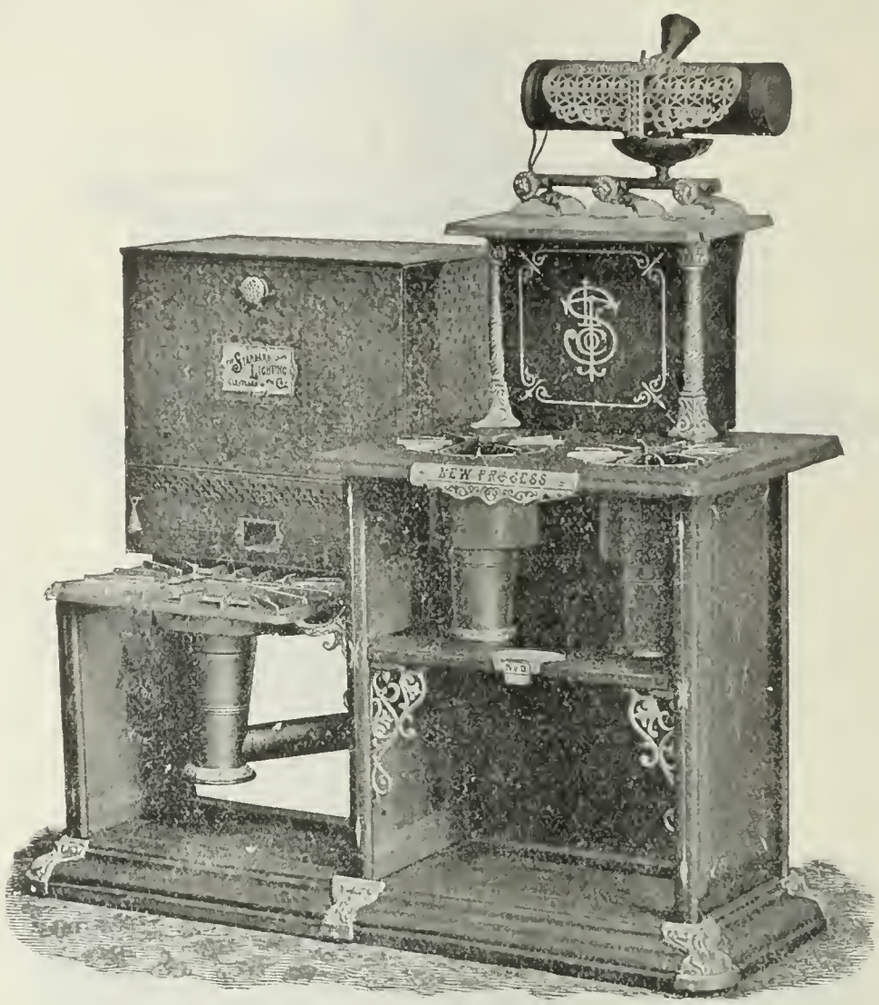
RINGEN STOVE Co. SAINT LOUIS

Old as the Oldest, New as the Newest.

If You Are Not, You Ought to be Selling

The "NEW PROCESS" VAPOR STOVE

The Most Popular and Successful Gasoline Stove Ever Made.



You have made a friend and some money, when you have sold a "New Process." Don't grope in the dark for "maybes," when, in the bright light of experience, you can buy a "sure thing" success.

No better recommendation can be given the "New Process" than that the following successful Jobbers after years of experience still sell it. Write them now for the agency.

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THE S. M. HOWES CO., Boston, Mass.

SOUTHERN JOBBERS.

W. B. BELKNAP & CO., Louisville, Ky.

THE NORTHWEST.

FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.

PACIFIC COAST STATES.

HOLBROOK, MERRILL & STETSON, San Francisco, Cal.

DOMINION OF CANADA.

THE THOS. DAVIDSON MFG. CO., - - Montreal, Quebec.

WESTERN JOBBERS.

COOK & VAN EVERA CO., Chicago, Ill.

MORLEY BROS. - Saginaw, Mich,

TOWNLEY STOVE CO., Terre Haute, Ind.

F. TIEMANN STOVE & HDWE. CO., St. Louis, Mo.

TOWNLEY METAL CO., Kansas City, Mo.

A. C. RAYMER, Omaha, Neb.

M. P. BORDEN STOVE CO., Denver, Col.

THE STANDARD LIGHTING CO., Cleveland, Ohio.

Reliable Vapor Stoves and Ranges for 1902.

DEALERS who are seeking a strictly high grade line of Vapor Stoves and Ranges that are standard the country over cannot afford to overlook our line. **"RELIABLE"** Stoves have the NAME and FAME as being the best and most successful to handle.



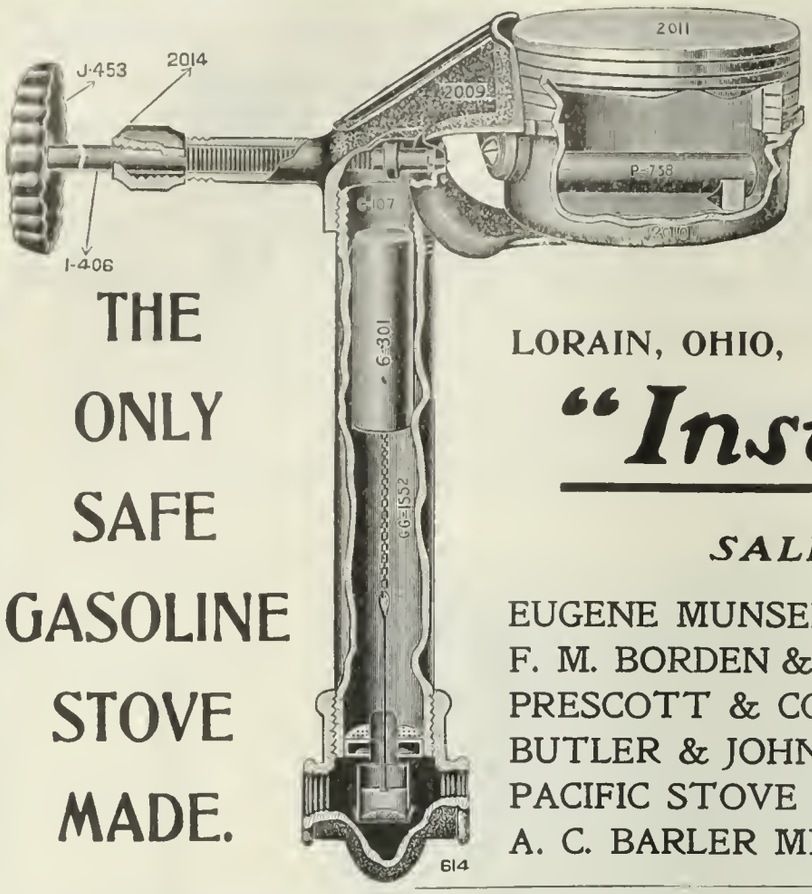
THERE are NONE better. A few are claimed as good. None as well and favorably known. Our reputation will not permit of our making any inferior goods. If you wish to control the Vapor Stove business of your city, secure the agency of the **"RELIABLE."** They have proved profitable and satisfactory to thousands in the past, and will to you.

Our line for 1902 is larger and finer than ever. Send for our latest catalogue. It is yours for the asking.

MADE BY

The Schneider & Trenkamp Company,

CLEVELAND. CHICAGO. SAN FRANCISCO.



NATIONAL STOVES

THE ONLY SAFE GASOLINE STOVE MADE.

LORAIN, OHIO, CHICAGO, 104 Lake St.

"Insurance"

SALES AGENTS.

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F. M. BORDEN & BRO., - - Philadelphia
PRESCOTT & CO., - - - Boston, Mass.
BUTLER & JOHNSON, - Syracuse, N. Y.
PACIFIC STOVE CO., - - Los Angeles, Cal.
A. C. BARLER MFG. CO., - Chicago, Ill.

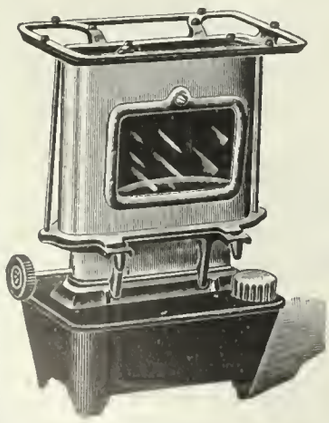
HARPER & McINTIRE CO. For IOWA, NEBRASKA. KANSAS, MISSOURI.

OTTUMWA, IOWA.

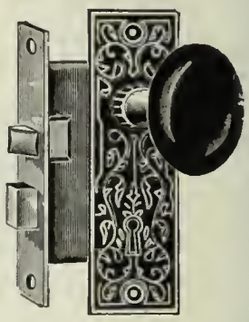
THE TAYLOR & BOGGIS FOUNDRY CO.,

MANUFACTURERS OF

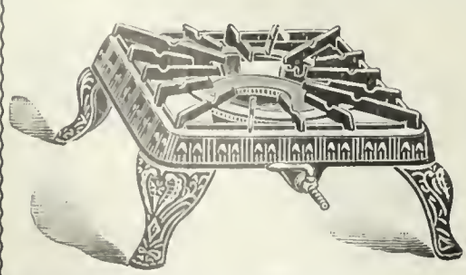
LIGHT GRAY IRON CASTINGS.



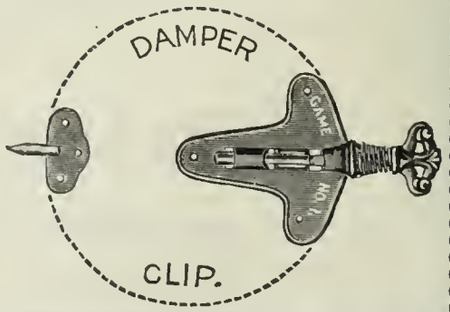
Builders' Hardware,
Dampers, Oil and Gas Stoves,
Furnace Lamps,
Molasses Gates,
Letter Boxes,
Hardware Specialties.



CLEVELAND, O.







JEWEL STOVES AND RANGES..

JEWEL STOVES AND RANGES
DETROIT STOVE WORKS
LARGEST STOVE PLANT IN THE WORLD

A Complete, Well Advertised Line; Low Prices and Good Workmanship.

Please Write for Catalogue.

DETROIT STOVE WORKS.

Detroit - Chicago.

1902

THE TWIN BURNER

Line for the New Year is far and away ahead of anything yet shown in

Gasoline and Oil Stoves.

Our New WICKLESS BLUE FLAME OIL STOVE is the equal of any in the market. Perfectly Safe.



No. 480.
Our New No. 480 can be used for Gasoline or Coal Oil.

TWIN BURNER VAPOR STOVE CO.

206-210 South Seventeenth St.,
ST. LOUIS, MO.

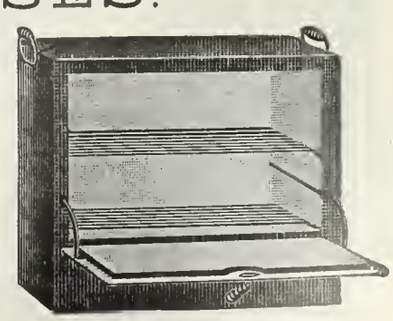
ACME LINE, 1902.

Asbestos Lined Ranges and Ovens, Cookers and Hot Plates.

FOR ALL GASES.



Catalog No. 35 on application.



H. ADLER CO.,
PITTSBURG, PA.

HENRY WATERMAN, - - 195 Lewis St., N. Y., Eastern Agent.

OUR

CATALOGUE,

SHOWING

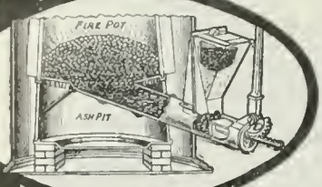
GAS RANGES
CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS

WILL BE FURNISHED FOR THE ASKING BY

Enterprise Stove Co., VINCENNES, IND.

IF YOU ARE NOT SELLING THE

Peck-Williamson Underfeed Furnace



you have not the trade and are not making the money you might. Just a pull or two of the lever feeds the new coal from underneath.

The Underfeed Furnace consumes less fuel than any other furnace ever built. The coal is burnt more slowly. All the heat units from it, as well as from the smoke, are utilized and all smoke eliminated.

Our handsome booklet explains its splendid heating qualities and coal saving.

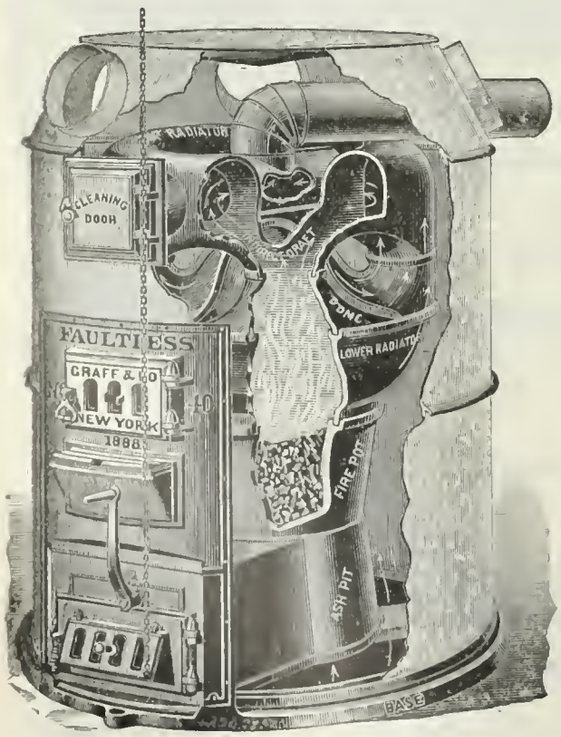
You may have this booklet and our special plans for selling. Ask for booklet about our Laundry Dryer also.



THE PECK-WILLIAMSON COMPANY,
CINCINNATI, OHIO.

FAULTLESS
FURNACES.

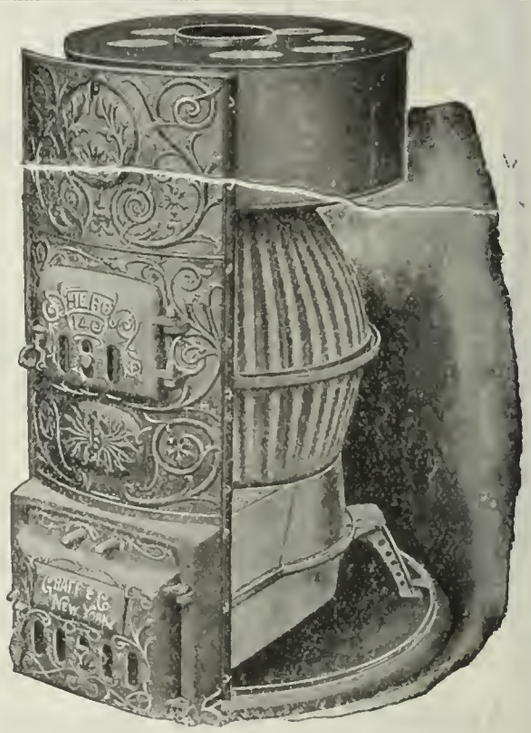
Hard Coal Style.
Soft Coal Style.



The Graff Furnace Co.

Manufacturers,
208 Water Street, New York.

ALSO CHEAPER FURNACES IF YOU WANT THEM.



HERO
FURNACES.

Hard Coal Style.
Soft Coal Style.

THE H.B.SMITH CO.,
WESTFIELD, MASS., U.S.A.

Catalogue furnished only upon application to

Heating Contractors, Engineers and Architects

64 Pages. Size 9 x 12 Inches.

INDIRECT RADIATORS

(16 STYLES)

PACIFIC COAST AGENTS

HOLBROOK, MERRILL & STETSON,
SAN FRANCISCO, CAL.

EUROPEAN AGENTS

AUG. EGGERS,
BREMEN AND NEW YORK CITY.

SALESROOMS:

THE H.B.SMITH CO.,

133 CENTRE STREET,
NEW YORK.

510 ARCH STREET,
PHILADELPHIA.

FIVE HUNDRED DEALERS



in the United States have sold **RIVAL** furnaces for the past fifteen years and are selling them now. They have allowed other dealers to put in the **CHEAP WORK** and have given their customers

RELIABLE FURNACES

wisely installed and thoroughly efficient in operation. Where **RIVAL** furnaces have been sold the general tone of a furnace business has been advanced to a higher level. Where they have not been sold the furnace business has been in disrepute. Dealers that have had an unsatisfactory business during the past year, have had

MUCH TROUBLE and LITTLE PROFIT

should consider that possibly it is owing to the character of the heaters they sell. We want good dealers to sell our furnaces, install them in a good manner, and good satisfaction will result with increased business at good profit Our catalog illustrates and describes the line of heaters we make and on application we will quote right prices.

GIBLIN & CO.,
UTICA, N.Y.

The FORBES FURNACE.

Height over all,
4 ft. 3 inches.



You run no risk in putting in the

Forbes Furnace.

When properly installed we guarantee them in every case.

They are constructed entirely of cast iron.

No sheet iron drums.

Our radiating tubes are ⅛ in thick, and will wear for years.

Specially suited for low cellars.

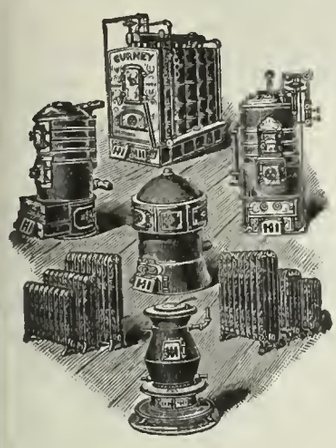
SEND FOR CATALOGUE AND FULL PARTICULARS.

Tubular Heating & Ventilating Co.,
228 Quarry St., Philadelphia, Pa.

Gurney

HOT WATER GENERATORS
HOT AIR GENERATORS
STEAM GENERATORS
RANGES *and* STOVES
REFRIGERATORS
STEEL RANGES
GAS RANGES
FURNACES

GURNEY AND COMPANY
WASHINGTON, HANOVER AND ELM STREETS
BOSTON, - MASSACHUSETTS



Even members of the same family are not always alike in virtue or ability, yet the

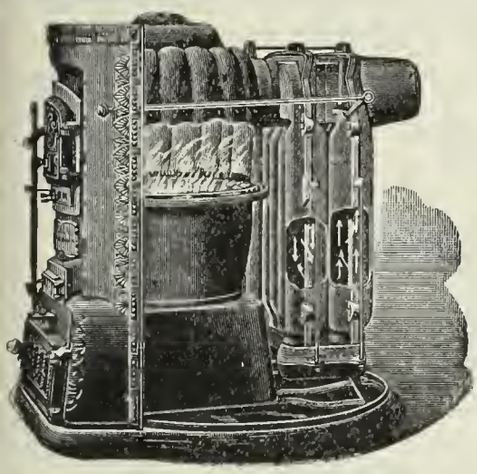
Gurney Heaters

Are of uniform excellence. In all of them the heating surfaces are so arranged as to produce a maximum of heat from a minimum amount of coal.

All are made from the best grades of iron, have the most efficient types of grates, and embody all the latest improvements. "Bright Idea," "Doric," and "400 Series" Steam and Hot Water Heaters are thus equipped. Sales of any of them will enhance your reputation. Would you become an agent? Let us hear from you.

GURNEY HEATER MFG. CO., 74 Franklin Street, Boston.
111 Fifth Ave., New York City.

Western Selling Agents, JAMES B. CLOW & SONS, 222-224 Lake St., Chicago, Ills.



Bengal Furnaces.

EASY TO SELL. SURE TO PLEASE.
LEADERS OF THEIR CLASS.

3,500 square feet of radiating surface—more than any other furnace their SIZE.

ALL CAST IRON.

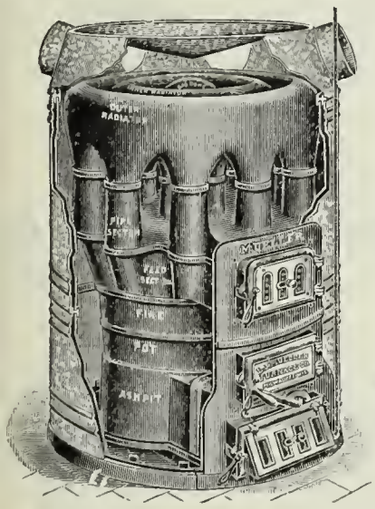
Secure a BENGAL AGENCY at once.

CATALOGUE ON APPLICATION,

EASTERN SELLING AGENTS:
GURNEY & CO.,
Washington, Hanover and Elm Streets, Boston, Mass.

FLOYD, WELLS & CO., Royersford, Pa.

All Cast Iron Double Radiator.



Quality First

IS THE PRINCIPLE FOLLOWED

In the Manufacture of

MUELLER

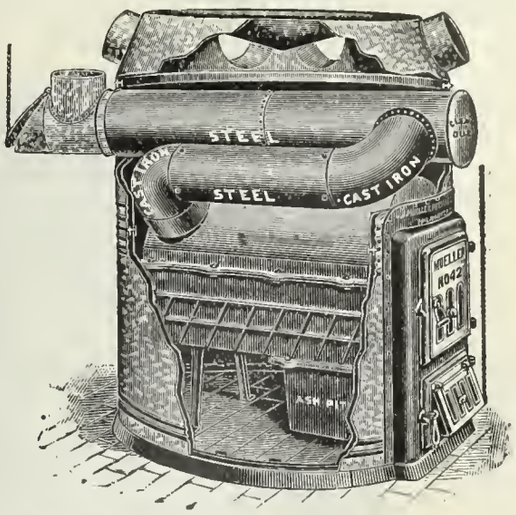
Furnaces and Boilers.

Made in all Styles—For all Kinds of Fuel.

Get Our Special Register Offer.

EVERYTHING IN THE HEATING LINE.

FOR WOOD.



190 Reed St., L. J. MUELLER FURNACE CO., Milwaukee, Wis.

BRAND STOVE CO.

STOVES, RANGES and FURNACES.

SEND FOR CATALOG.

MILWAUKEE, WIS.

THE average manufacturer of Furnaces, when getting out a new Furnace, thinks it necessary to have special talking points; something different from his competitor.

Perhaps, if he works on it long enough and dwells upon the why and wherefore of some complicated flue construction, massive front, artistic ornamentation, he really believes he has the great and only best heater and coal saver that ever was, and wonders why you can't pay him extra dollars for it.

The average dealer has already learned a lot about theory; it's results that count.

Set a *"DIGHTON"* in the next house or same block of houses where there is a chance for fair comparison, ask your customer how many rooms are heated, how much coal was used, how many months he had a fire; if at the end of *one,* two, five or ten years your customer don't think the *"DIGHTON"* the best value of any furnace on the street, let us know about it.

Name, sentiment, theory or ornamentation don't count so much as results.

Compare *"DIGHTON"* results with any other Furnace, no matter what the price of it may be.

DIGHTON FURNACE CO., - - Taunton, Mass.

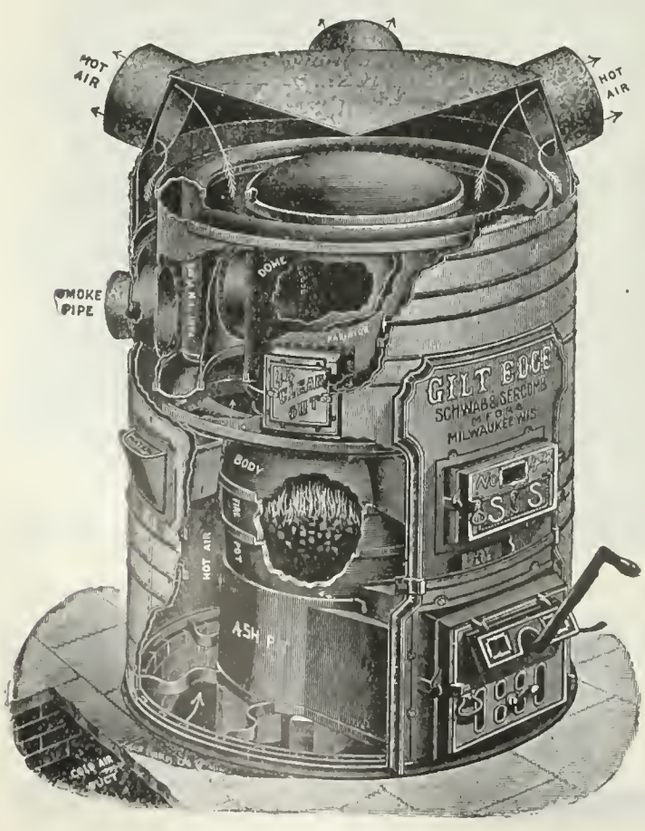
For a swell job

You ought to know our line—many a dealer loses an opportunity to make a good profit because he knows only heating stoves and furnaces.

We can post you concerning steam and hot water heating, so you can get a share of what is due you.

KEWANEE BOILER COMPANY

KEWANEE, ILLINOIS.



Gilt Edge Warm Air

AND

Combination Heaters

have merits that are all their own. They are made in a large variety of styles and sizes, each adapted especially to a certain class of fuel. We are manufacturers of a complete line of Warm Air Registers, Safety Pipe and Tin Galvanized Iron Furnace Fittings.

R. J. SCHWAB & SONS CO.,

MILWAUKEE, WIS.

Royal Heaters.

MANUFACTURED BY THE

HART & CROUSE Co.

UTICA, N.Y.

ALL THE LEADING LINES OF

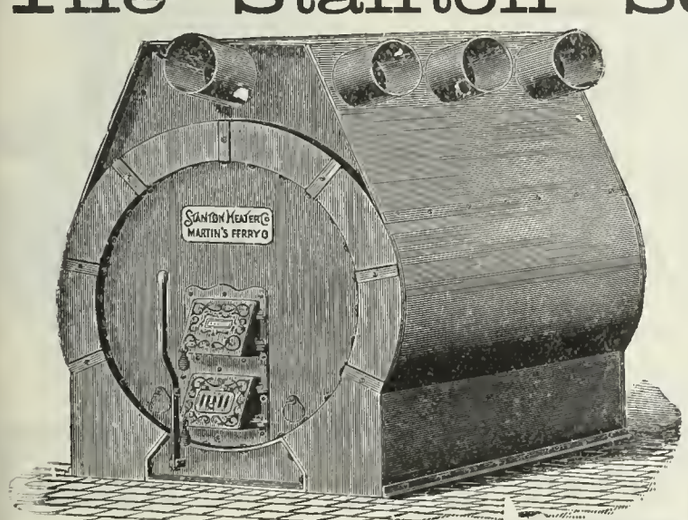
STEAM, HOT WATER & HOT AIR,

FOR HEATING ALL CLASSES OF BUILDING.

235 WATER ST., N.Y. BRANCHES. 79 LAKE ST., CHICAGO.
COLUMBUS, O. ST. LOUIS.

The Stanton Seamless Heater,

PORTABLE CASED.



CADIZ, OHIO, June 18th, 1900.

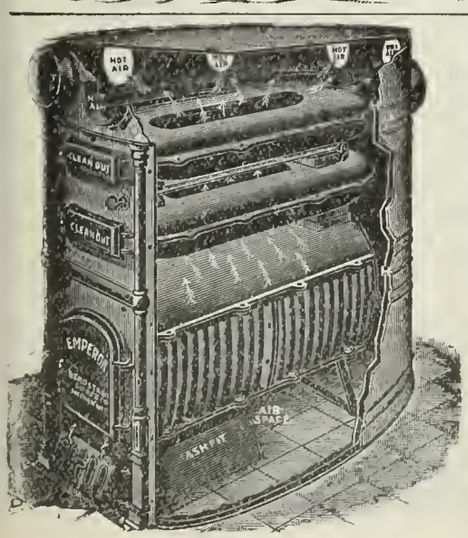
GENTLEMEN:—We had a Stanton Furnace No. 84 put in last Fall and have nothing but praise to say of it. The space heated is 50,400 cubic feet, which it keeps comfortable in the coldest weather. Our fuel costs only one-fourth what it used to and besides is perfectly clean. We take pleasure in recommending it. Respectfully,

J. EHRHART, Hotel Ehrhart.

SEND FOR CATALOGUE.

THE STANTON HEATER CO.,
Martin's Ferry, Ohio.

See Our Advertisement Next Week.



Emperor Furnaces

FOR WOOD.

Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces. . . .
Furnished for either Brick or Galvanized Iron Casing

SEND FOR CATALOGUE.

Bergstrom Bros Co.

NEENAH, WIS.

They regulate heat in residences, offices, stores, mfg. plants. Guaranteed.

The Howard Thermostat Co.

West Water Street, Oswego, N. Y.

No electricity or compressed air Simple as a heavy spring motor can be.

Would like to send you their catalogue and give a few reasons why you should sell their Heat, Valve, Draft and Damper Regulators. This should be an interesting topic. We have the most simple thermostat made; also the most sensitive. Only three parts—a sensitive and powerful sensitive plate, a heavy spring motor made of brass, and common pulley connections. Just enough material to do the work satisfactorily, but not one atom too much. They do "straight work," without the aid of outside agencies. No other thermostat on the market can do more with all of its electricity and compressed air connections.

THEY SAVE THE COAL

WHICH IS WASTED BY THE WRONG OPERATION OF FURNACE OR BOILER DAMPERS.

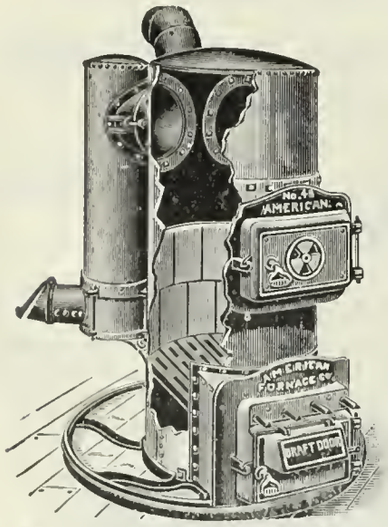


WINCHESTER

The value of time was never more appreciated by the people than at present. Can the fitter afford to lose any time in securing the agency of the "WINCHESTER" Heater, justly acknowledged to be "America's Greatest Heater?" Made by Smith & Thayer Company, Boston, Mass., 106 Beekman St., New York.



HEATER.



Burn Hard or Soft Coal, or Coke. Large Doors.

About Fire Pots.

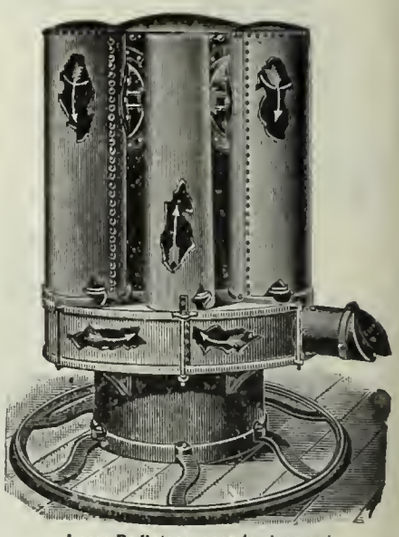
We formerly lined our fire pots with cast iron—then they cracked and warped. Now we use fire brick for lining and will guarantee it for five years. The lining is replaced through the fire door.

The **AMERICAN FURNACE** is made strong in places where other furnaces have proven weak; it is made of heavy steel and riveted tight like a boiler. Will burn any kind of fuel.

You can only build up a permanent furnace business by handling a first-class furnace. We manufacture for the better class of trade.

The American Furnace Co.,

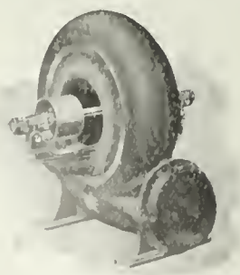
1911-13 PINE STREET, · ST. LOUIS, MO.



Large Radiators, easy to clean out.

Write for prices and secure the agency before the other fellow gets it.

The "A B C" Volume Blowers and Exhausters.

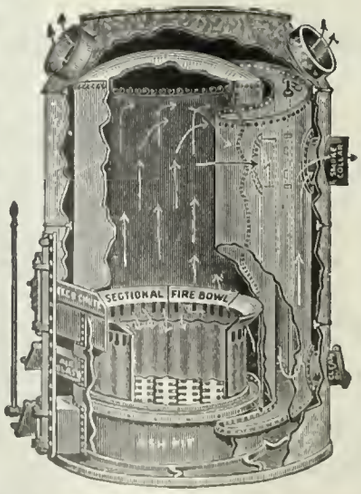


Scientific in design. Construction and efficiency guaranteed.

American Blower Co.,
Detroit, Mich.

New York. Chicago. London.

The Torrid Zone Furnace



is a trade winner because it has points of merit peculiar to itself that can be found in no other steel furnace. Our new catalogue is now ready to mail and a description of our Hot Air and Hot Water Combination Furnace can be seen in it. We furnish either the cast iron lining or the fire brick at the same price. Our Wood Furnace is called a powerful heater by those who use it.

CATALOGUE FREE.

Lennox Manufacturing Company,

Eighth Ave. and Frederick St.,
MARSHALLTOWN, IOWA.

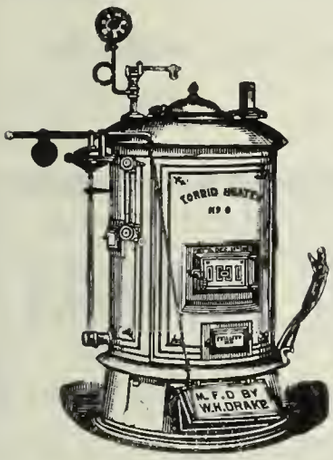
STAMFORD FOUNDRY COMPANY

MAKERS OF

RANGES COOKING AND HEATING STOVES
HOT-AIR AND COMBINATION AIR AND
WATER FURNACES
LAUNDRY STOVES CONFECTIONERS' STOVES
CABOOSE RANGES ETC ETC

STAMFORD CONN

"TORRID HEATER."
FOR STEAM OR HOT WATER.



It is Practical in Design.
It is Safe, Being Tested to 200 Pounds.
It is Easy to Manage and Keep Clean.
It is Durable.
It is Sectional and Easily Handled.
It has No Packed Joints.
It is Self-Feed or Surface Burning.
It has the Torrid Patent Rocking and Dumping Grate.
It is Low in Price.

SEND FOR CATALOGUE.

MANUFACTURED BY

W. H. DRAKE, No. 36 Clinton St. NEWARK, N. J.
Factory: Hackettstown, N. J.

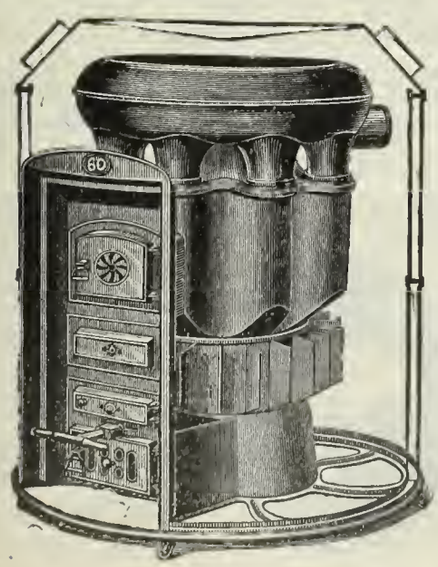


Brien Heater.

A perfect, all cast WOOD or COAL burner. There is no other Hot Air Furnace as low down as the "BRIEN."

Write for territory, catalog and prices.

BRIEN HEATER CO.,
HOOSICK FALLS, N. Y.



Imitation is Flattery.

Cory's All Cast FURNACES

HAVE BEEN COPIED
BUT NEVER EXCELLED.

An Absolutely Gas Tight Furnace
Without Bolted Joints.

UZAL CORY & CO.,
210 WATER ST., NEW YORK.

Established 1847.

HOT WATER AND HOT AIR

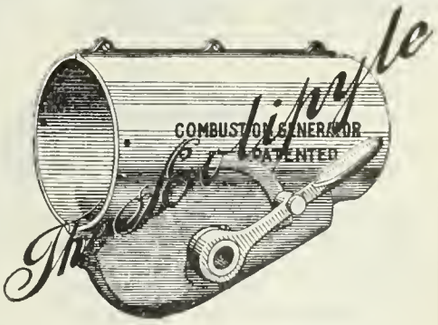


HEATING BY COMBINATION STOVES AND FURNACES.

Suitable for Large or Small Houses, Stores, Conservatories, Barber Shops, Hotels, etc., etc.

Heat Water Quickly.
Circulation is Positive.
No Joints Inside to Leak.

THE NATIONAL PIPE BENDING CO
160 RIVER ST., NEW HAVEN, CONN.



Saves Coal, Increases Heat,
Keeps Temperature Even,
Prevents Escape of Coal Gas,
Reduces Labor,
Avoids Sifting Ashes,

When Applied for Domestic Use to Smoke Pipe of

House Furnace,
Hot Water Heater,
Low Pressure Boiler,
Stove or Range.

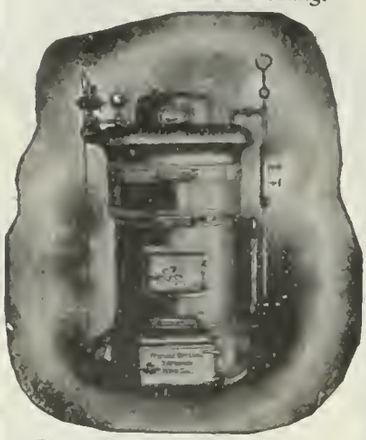
Æolipyle Company,
237 Water St., New York,
Tel. 1849, John. U. S. A.

SCRANTON CORUNDUM & EMERY WHEEL CO.
1311-1315 Capouse Avenue, SCRANTON, PA.
Write for Catalogue.
OUR "BLACK DIAMOND"
artificial abrasive wheels are especially adapted for
The Stove Trade
THEY ARE THE BEST.

Pierce

BOILERS and RADIATORS

for Steam and Water Heating.



Pierce Touraine Steam Boiler.

LARGE HEATING CAPACITY.
ECONOMIC IN FUEL CONSUMPTION.

Endorsed by the foremost Architects and Heating Engineers.
Write for New Illustrated Catalogue.

Pierce, Butler & Pierce Mfg. Co.,
Syracuse, N. Y.
New York. Boston. Philadelphia.



EVERYBODY OUGHT TO KNOW ABOUT THE

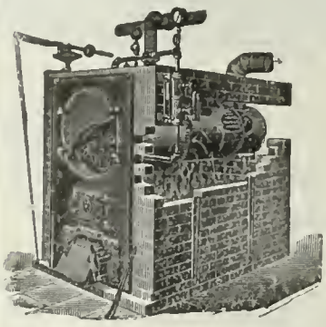
RICHMOND

HEATERS.

THEY HEAT YOUR HOUSE WITH LESS COAL AND LESS TROUBLE THAN ANY OTHER HEATER.

Write for Catalogue.

The Richmond Stove Co., Norwich, Conn.

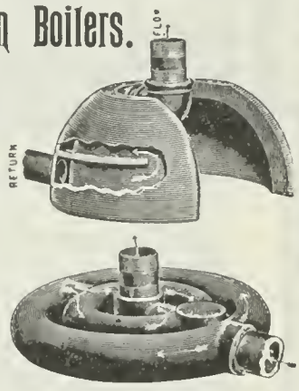


Vance Boilers.

The most economical Steam and Hot Water Boiler on the market. Write for Catalogue and Price List.

VANCE BOILER WORKS,
373 Atkinson St., Geneva, N. Y.

The Champion Hot Water Combination Boilers.



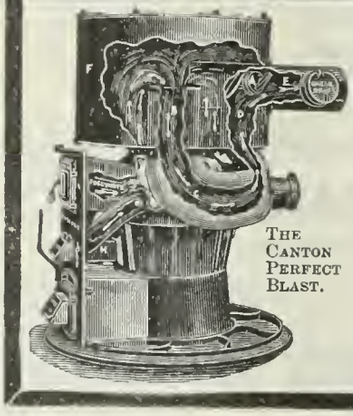
They Fit Any Furnace.

Base section when used without ring sections.

Ring Section.

These Boilers are made in three sizes diameter, and from 100 to 600 square feet radiation capacity.
Will heat those cold rooms, or an addition to the building. Will increase the capacity of any furnace. Are cheaper than coils and will do more work.
Write for new circular. Manufactured by

FRANK D. STOLZ,
115 Lake St., Chicago, Ill.



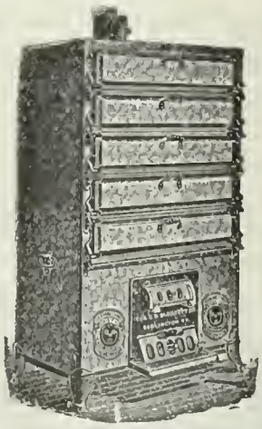
THE CANTON PERFECT BLAST.

CANTON PERFECT BLAST AND OAK

WARM AIR FURNACES

Heavy Castings, Tubular Radiator,
Large Secondary Radiator,
A Perfect Blast,
ALL INSIDE THE CASING.

THE BONNOT COMPANY, Canton, O.



CABINET PORTABLE OVEN.

OUR LATEST PRODUCTION.

BAKES EVENLY BY THE CIRCULATION OF HOT AIR.

FOR BAKERS, CONFECTIONERS, HOTELS,

Also the best oven for Core Baking, Japanning, Enamelling, etc.

Made in six sizes, single and double, for coal, wood, natural or artificial gas.

SEND FOR CATALOGUE.

The G. S. BLODGETT CO., Burlington, Vt., U. S. A.



WE don't expect you to buy Independent Registers unless it is to your advantage. But let us quote our prices.

Independent Register Co.,
152 Champlain St.
CLEVELAND, O.

We Protect Dealers

WHO HANDLE BURTON'S



FUEL ECONOMIZER.

Give us a trial order.

W. J. BURTON & CO.,
164-166 W. Larned Street, Detroit.

THE S. & S. PATENT

Stove Pipe Thimble



Locks the Pipe from Pulling Out, and from Pushing In and Closing the Draught. Will last a lifetime. Nothing to wear out, and costs but a trifle. *Send for sample* and prices.

City Forge and Iron Works,
DAYTON, OHIO.



An Unprecedented Offer to Furnace Dealers.

We will sell you one of our No. 36 UTICA HEATERS, with tin lined galvanized casing, as shown in accompanying cut. This furnace has 22 in. firepot and 36 in. casing; with five hot air collars; two single wall pipes; two hoods or booths; two register heads; two 9 x 12 convex registers; three 9 x 12 registers and borders, with three register boxes for same; two 8 in. and three 9 in. 4-piece hot air elbows; two 8 in. and three 9 in. hot air dampers; 16 ft. of 8 in. and 25 ft. 9 in. hot air pipe; two 7 in. galvanized smoke pipe elbows and 8 ft. 7 in. galvanized smoke pipe; one 7 in. galvanized tee, with regulating damper attached; chain, pulleys, and chain plate for regulating the furnace. All the above, boxed and crated, $58.00, with 5 per cent. off for cash, thirty days.

We will sell one of our No. 40 UTICA Heaters, with 24 in. firepot, 40 in. casing, with three pipes and registers for second floor, and four pipes and four registers for first floor, with smoke pipe, dampers and other fixtures as specifed above for $73.00, 5 per cent. off thirty days.

We use only Tuttle & Bailey Registers, the best hot air pipe and galvanized iron for fixtures in the above unprecedented offer. We deliver the same F. O. B. cars, Utica, N. Y. This offer holds good for February, March and April shipments.

Furnace and Boiler catalogues upon request.

UTICA HEATER COMPANY,

UTICA, NEW YORK.

STOVE REPAIRS

Stove dealers' SUPPLIES of all kinds.

Water Fronts a Specialty.

WE GUARANTEE PROMPTNESS IN FILLING ORDERS

Catalogues, Order-Books, Postals or Envelopes sent upon application.

Largest Jobbers in New England

HENRY N. CLARK CO.

56 and 58 Union St.,

BOSTON. MASS.

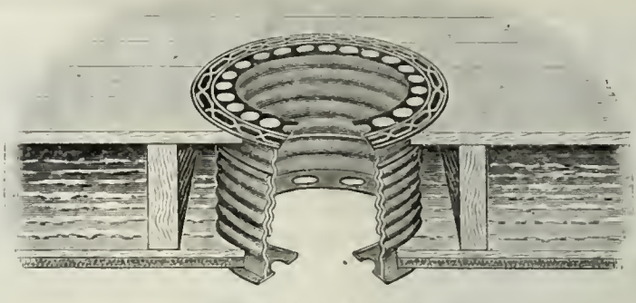
STOVE BANDS
—AND—
RINGS.

SPECIAL TUBING.
Cut to Length and Plated.
FLAT STRIPS & CORNERS.
SPECIAL
PUNCH
PRESSWORK
SOLICITED.
Quality and Finish the Best.
The Kirk Manufacturing Co.,
TOLEDO, - - - OHIO.

PATTERNS
FOR STOVES AND HEATERS.
First-class in wood and iron.
Vedder Pattern Works, - Troy, N. Y.

SELECTED
MICA
ONLY.
Prepared expressly for the Stove and Hardware Trade.
Two Grades: "North Carolina" and "Nevada."
PRICE LISTS AND DISCOUNTS SENT ON APPLICATION.
THE PALERMO MICA CO.
115 Beekman St., New York.

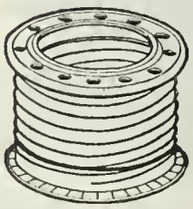
PATENTED IN U. S. and CANADA.



THE O. K. IS A NOVELTY.

THE EASILY ADJUSTED
O. K. STOVE PIPE THIMBLE
FOR PARTITIONS AND CEILINGS.

Made in two parts which screw together and adjust to any thickness of floor or partition. They hold the plaster firmly and are not loosened by any agitation of smoke pipe. Have no springs to get out of order or no loose parts. Made of bright tin with ends handsomely japanned.



Price Same as Other O d Style Thimbles.
Trial orders solicited through jobbing trade or direct. Travellers' model samples supplied.





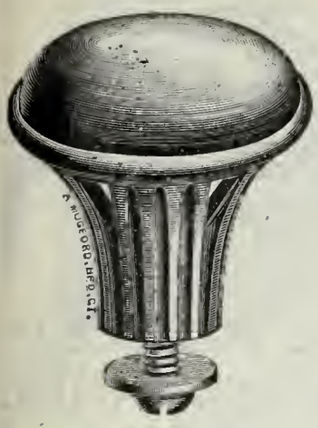
O. K. MANUFACTURING CO., 45 N. Division St., BUFFALO, N. Y.
CANADIAN REPRESENTATIVES,
THE METAL SHINGLE & SIDING CO., Ltd., Preston, Ont.

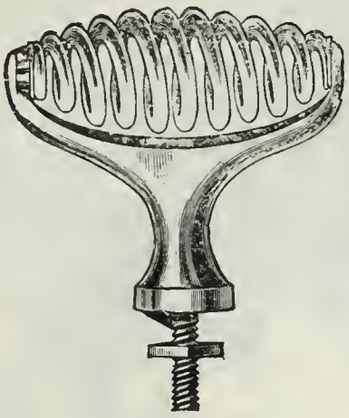
20th Century Gas Stoves
THE BEST GAS STOVE MADE.
Best Materials and Workmanship. Prices Low. Mail Orders Promptly Filled.
STOVE REPAIRS IN STOCK
FOR 2,000 STOVES AND RANGES.
Write for Prices.
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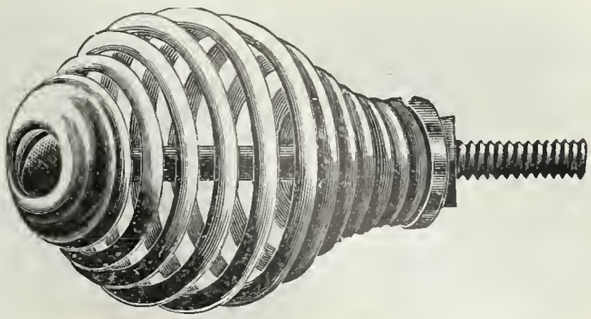
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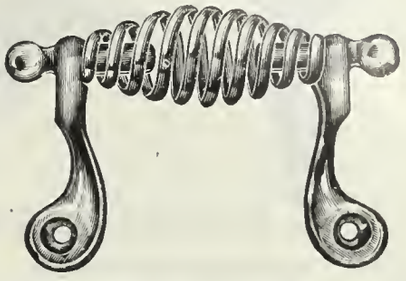


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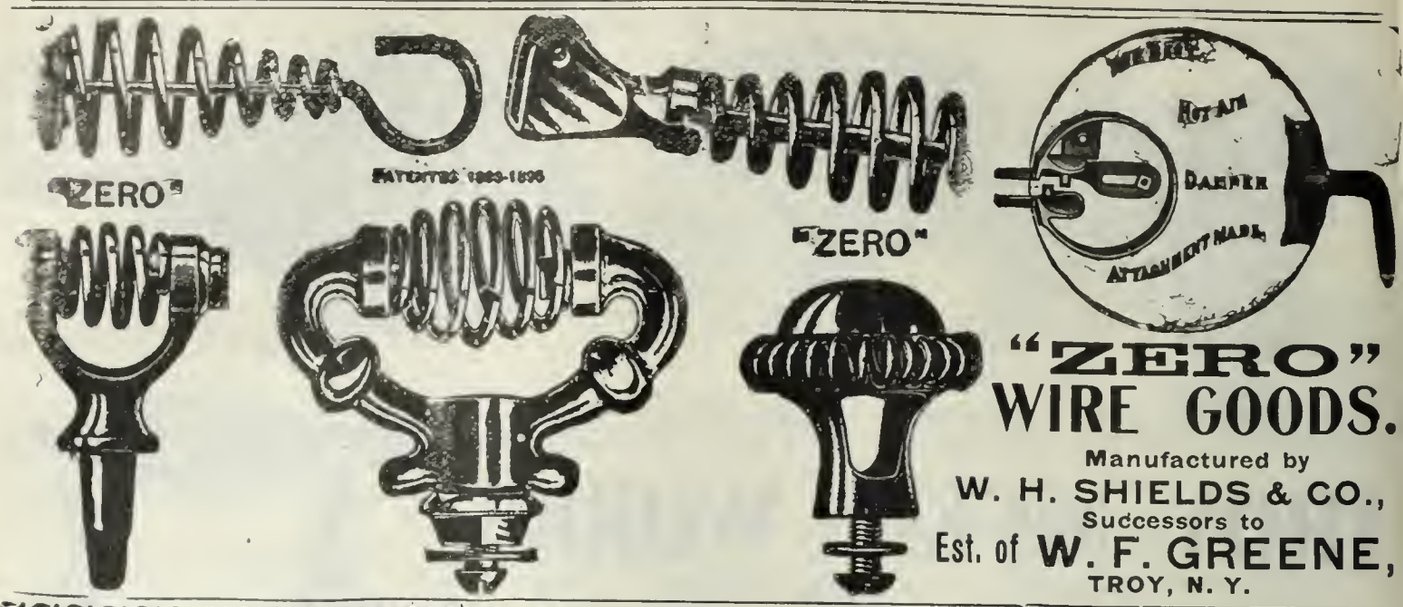
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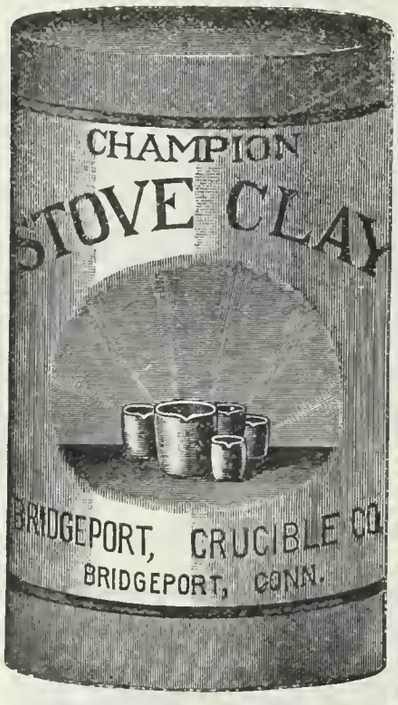
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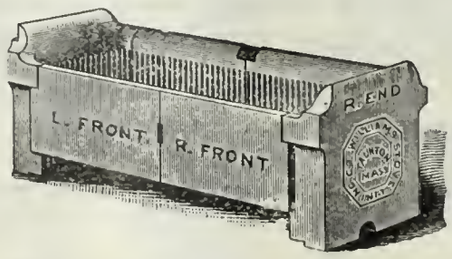
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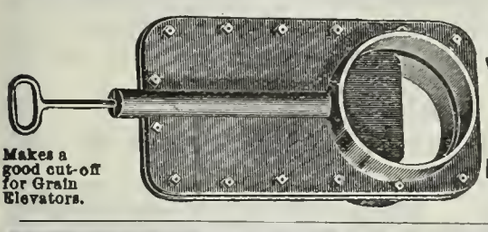
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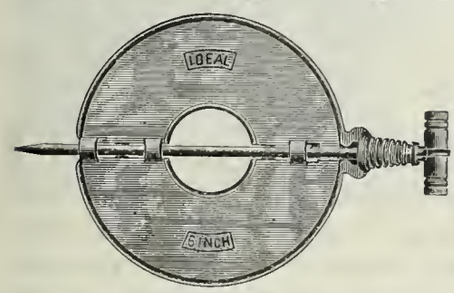
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Finding Leaks,
Putting Up Fixtures,
Gas Logs,
Economical Gas Burning.

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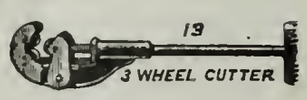
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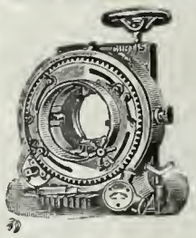
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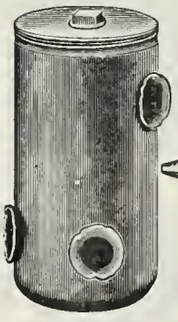
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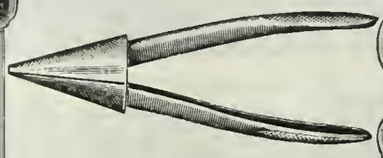
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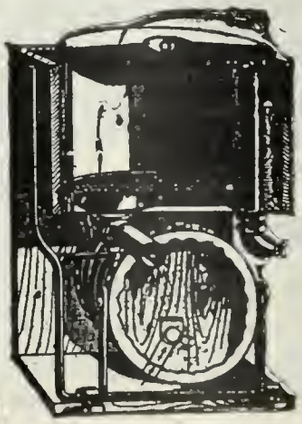
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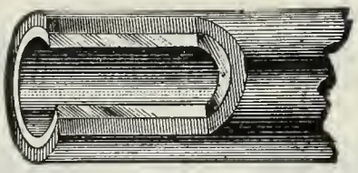
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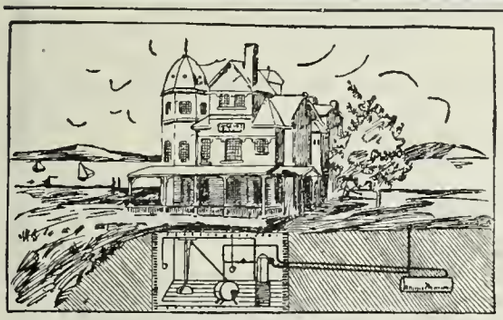
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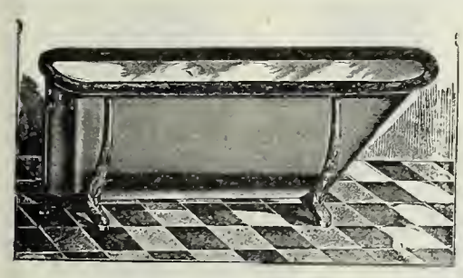
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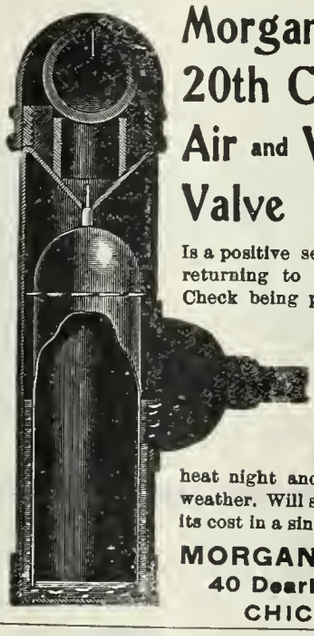


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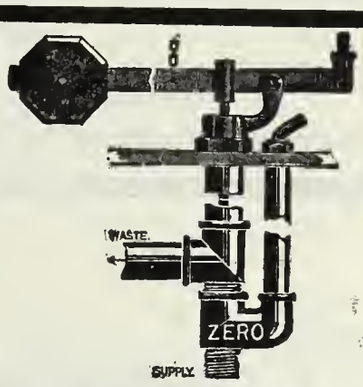
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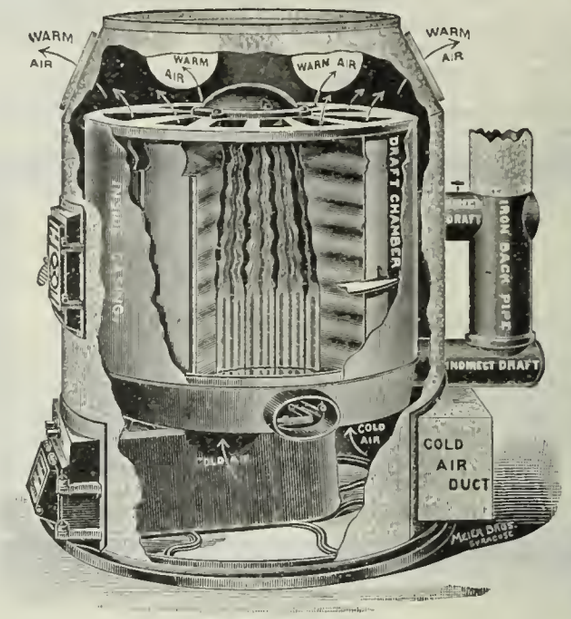
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This is accomplished by sending the air in **separate channels through** the long hollow corrugated cast iron sections which form the fire chamber.

This is a far more effective method, and the air is more thoroughly and evenly heated, than by simply **passing over** or **next to** a hot surface.



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Each section has eight square feet of heating surface, and weighs about seventy pounds. There are from nine to seventeen sections in each generator, according to its size. This means a powerful and economical heater, and an abundance of pure warm air. Each section is an independent heat generator, and by capping over one or more, and extending a heat-conducting pipe therefrom, the warm air is forced through long or level pipes to the rooms so connected.

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New York, February 8, 1902.

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Protection in the Plumbing Trade.

Trade protection is regarded as an eminently proper principle and is observed more or less in all branches of trade. The protection which has been accorded to the plumber by manufacturers and dealers in plumbing goods has been generous, and it is unfortunate that there should be a division of opinion among the contracting plumbers as to the satisfactory character of this protection. It is freely conceded by all who are thoroughly informed on the subject of trade protection that the plumbing trade is protected to an extent that is enjoyed by no other trade in the United States to-day. The recognition of this fact by conservative plumbers in various sections makes them impatient with the course that is being pursued by some of their fellow members in the trade. In some instances the harmony that formerly existed between local associations in different parts of the same State has been destroyed by the difference of opinion in regard to this matter. In a recent issue we pointed out that some wholesale houses were being notified that unless a grievance, which the latter had not had an opportunity of discussing, was satisfied within a specified time, an order would be issued to the members of the local plumbers' association to withhold orders from those houses. This is looked upon by conservative men in both the wholesale and contracting branch of the business as a rather extreme step, which might be made the basis of action in the courts. Notwithstanding this action in one State reports come that an association in another State are circulating a letter—without a signature, however, although its source clearly seems to be a master plumbers' association—calling attention to an indictment for conspiracy against a master plumbers' association which is said to have been secured through the assistance of a supply house. It is claimed that the statement is made in the indictment that the supply house were threatened with a boycott if they sold material to other than members of the local association. This statement, the circular says, can be proved to be without foundation. The last sentence of the circular letter is as follows: "Appeal is now made to individual members of State and National associations and officers and members of local associations, to stand loyal to the Cleveland Resolution, and if protection of one is the concern of all, it is forcibly needed in this case." Apparently those who prepared this letter did not sympathize with the general feeling that action before the court is to be avoided whenever possible. Already suits have been brought in various parts of the country which have resulted in making public much information that is not of benefit to the plumbing trade. While for some time the manufacturers have taken no action and have not given expression to their views on existing conditions in the plumbing trade, the plumbers seem to have felt no reluctance in assuming a position which, instead of facilitating the restoration of harmony, tends rather to make the settlement of differences more difficult and more remote.

Heating Surface in Boilers.

It is evident that those who design heating plants are becoming desirous of securing such fuller information in reference to the various parts as will enable them to judge of the efficiency of the work. The winter always affords opportunity for study and comparison of the proportion which exists between different parts of a successful apparatus. Heretofore many steam fitters have been satisfied to know the size of the grate in the boilers which they purchased, and thereby have judged of the efficiency of the upper structure for carrying the radiation for which it is rated by the manufacturers. Men who have given the closest study to their work have found, however, that the most satisfactory boilers have a given amount of flue and fire surface. The catalogues of manufacturers have heretofore contained various dimensions of their boilers, but in most instances information as to the surface exposed to contact with the fire, to radiation from the fire and to the flame and gases rising from the fire, has been omitted, the contractor being satisfied to accept the manufacturers' rating or discount it, according to his judgment and experience. There is a class of heating contractors, however, who are now asking that the surface exposed in the boilers be included in the dimensions given in the manufacturers' catalogues, so that they may be better guided in their selection of a boiler for given work. This seems to be a reasonable request, and, as some catalogues already contain this information, it is probable that if the desire for this information is generally shown it will be as generally complied with.

To Abolish Strikes

The announcement from Pittsburgh that the Executive Committee of the Amalgamated Association of Iron, Steel and Tin Workers had arrived at an agreement with the American Steel Hoop Company and the Republic Iron & Steel Company, whereby the mills of those concerns will not shut down this year pending the annual adjustment of the wage scale, marks a gratifying step in the right direction. This action, it may be assumed, will have the effect of doing away with the danger of strikes, at least so far as the employees of the corporations named are concerned. It also holds out the expectation that the precedent may be followed in other works in which the Amalgamated Association is recognized. The hope that there will be no strike over the wage question this year, even if a disagreement over the scales should arise, seems to be justified by the present attitude of the Amalgamated leaders. The new wage scales will be formulated at the annual convention of the

association, to be held at Wheeling, W. Va., in April, nearly two months earlier than heretofore. A strong effort, it is understood, will then be made to have the scale adopted for the present year extend through three years. This proposal, it will be remembered, was made last year, but was not indorsed by a sufficient number of the Amalgamated Association lodges. Since that time, however, it is said the sentiment of the workers has gradually become more favorable toward the idea, so that there is now a much better prospect of the adoption of the three-year wage scale policy. It would seem that such an arrangement should be regarded as eminently desirable from the standpoint both of the manufacturers and the workmen, for it would do away with the annually recurring harassing uncertainty which hitherto has surrounded the question of the wage scales. President Shaffer, at a mass meeting of Amalgamated workers the other day, expressed himself in the strongest terms as opposed to strikes. He declared that the disastrous defeat of last summer had taught the Amalgamated Association a lesson which would not need repetition, and that there would not be another strike. This is right in line with the growing sentiment throughout the country, which found its expression in the recent industrial conference of the National Civic Federation in New York City. It is a gratifying fact that strikes are becoming more and more difficult of accomplishment, and that labor leaders everywhere are declaring against their use. There is no reason to expect an early industrial millennium, but every ground exists for expecting the gradual abolition of strikes. This is much to be thankful for.

Retail Hardware Associations.

An opportunity will be given during the present month to all who are interested in the matter of retail hardware organization to study the spirit, progress and tendencies of this important movement. While it is only within a few years that there has been anything like a general effort on the part of retail merchants to associate themselves together for the advancement of their interests, the movement has attained a recognized position in the trade and the associations are beginning to exert an important influence. While many manufacturers and jobbers were at first inclined to regard the movement as impracticable, if not objectionable, it has in very large measure come to command the respect and approval of the trade at large. In the various State associations many strong and progressive merchants are brought together to deliberate on matters affecting their mutual interests. The contact of merchants who come together for this object is in itself very desirable and cannot fail to have good results. The way in which the many trade questions are considered by them will give especial interest to the many meetings of their associations, so many of which occur this month. There are so many advantages connected with organization among the retail trade, and so much to be accomplished in the advancement of its interests, that we bespeak for the various State associations the loyal support of the merchants. In most of the States the membership is as yet comparatively limited, when, in fact, it should embrace all the larger and more progressive retail merchants. It is perhaps too much to expect that merchants doing a very limited business in remote places and out of touch with the trade at large should become actively identified with the movement. The movement is one, however, which makes especial appeal for the sympathy and co-operation of merchants of breadth of view, up to date methods and progressive spirit. The manner in which this representative class regard trade questions and tendencies will be watched with much interest, not only by other retail merchants throughout the country, but by manufacturers and jobbers who desire to be in touch with their customers, whose attitude on these questions has so important a bearing on the welfare and policy of the trade as a whole.

Wages and Plumbing Companies.

There are many indications that the course of 1902 will be marked by efforts for a change in the wages of plumbers throughout the country. Reports from many cities show the existence of a demand for shorter hours and increased pay, as well as an agitation of the apprenticeship question in a manner that threatens the interests of the master plumbers. Unfortunately there is manifested a feeling that the master plumber can charge his customers any price he desires, so as to reimburse him for the payment made in wages to his workmen. There seems to be an indifference on the part of the journeyman plumber as to the financial result to his employer, when he loses an hour from whatever cause. For this hour he receives pay, but it may cause a loss to his employer from the day's work. There can be no doubt that in the course of a year the agitations of the wage question in its various forms by the journeyman plumber costs him several days' work, which loss could be avoided if this annual agitation of the wage question could be obviated This question has been successfully solved in some instances by the employer forming a plumbing company and taking into the company with him enough practical men to do all of the work that will ordinarily come to the shop in dull seasons. By this plan it is only necessary to hire a little extra help at the market price in the rush season. At all other seasons the members of the company do the work at a regular wage and participate in the profits, if there are any, at the end of the year. It has been the experience of those who have formed such companies that the practical members of the company accomplish more work, take a more lively interest in their work, and do it better than when employed as journeymen. If these men estimate on a piece of work they are ambitious to carry it out within the time of their estimate, and are willing to work harder to do this in case they have made an error in underestimating. They have a deeper interest in establishing a reputation for good work and in pleasing customers. The increase of such companies throughout the United States has been very marked within the past year, and the adopting of this policy is now being contemplated by many others who heretofore have been much harassed every spring by the annual agitation of the labor question.

It is one of the accompaniments of prosperity that the demand is unusually large for articles of high grade and necessarily of high price, and this has been particularly true since 1898. Added to this is the growing taste and intelligence of the people, which call for better things. In the days of depression—which sooner or later must ensue—it will be interesting to note as to what extent the demand will be for cheaper and inferior goods, and also as to what extent public taste has moved up to a higher plane of appreciation of quality and excellence.

Consolidation in the Stove Trade.

Those who favor a consolidation of interests in the stove trade have naturally withheld information of their efforts and success from those not directly interested. This, however, has not prevented rumors to the effect that the success of such efforts is near at hand, and credence is given to the various rumors according to their source. "One who is to go in" is reported to have said that "forty-two Western stove concerns will, on March 1, enter a combination or a trust, with a capital of several millions." The report also has it that some concerns who desire to enter have been denied. Recently there have been several increases in capitalization among stove houses that are looked upon by some as preparatory steps to consolidation. It is also an open secret that the deliberations of the Boston convention were given up to the discussion of various phases of the consolidation question, and that several promoters and lawyers have been identified with such a scheme during the year. Among the many rumors current is one to the effect that the manufacturers invited themselves to New York for the next convention, in May, so that a consummated consolidation might be announced at this important center. Time will verify or refute these various rumors and reports.

The American Iron & Steel Association has published complete statistics of the production of all kinds of pig iron in the United States in 1901, based upon reports received from the manufacturers, also complete statistics of all stocks of pig iron on hand on December 31, 1901. The total production of pig iron last year is shown to have reached the enormous total of 15,878,354 gross tons, against 13,789,242 tons in 1900; 13,620,703 in 1899; 11,773,934 in 1898, and 9,652,680 tons in 1897. The increase in the first half of 1901 over the second half of 1900 was 1,527,940 tons, and the increase in production in the second half of 1901 over the first half of the year preceding was 529,128 tons, the total increase in 1901 over 1900 being 2,089,112 tons. This is a far larger increase than was shown even in the boom year 1899 over 1898. The total stocks of unsold pig iron on December 31, 1901, amounted to only 70,647 tons, against 442,370 tons at the close of 1900, and 372,560 tons on June 30, 1901.

Those who are familiar with the way in which New York City is laid out are impressed with the fact that the city block is the unit. With the exception of certain localities, in each block may be found the elements of a town. The avenue frontages serve to make the main streets where the business of the little town is done, and along the side streets and above the stores are the residences of the people. A study of an individual block in the city shows that practically every want of mankind may be satisfied in its limits. If communication with the world were suddenly shut off the inhabitants of each city block would not have to go beyond the confines of their little settlement to find the means of filling every want. Each block has its butcher shop, its bakery, its grocer, generally two or three saloons, a drug store, or perhaps two; two or three green grocers and fruit merchants, several small dealers in coal and ice, a barber shop, several doctors and an undertaker's shop. It is a strange thing that the depot for coffins is often between a butcher shop and a drug store.

Hollow blocks of cement instead of bricks are coming into general use for building purposes in Denmark, the blocks being made 13 x 13 or 9 x 13, according to the character of the wall. A mixture of sand and slow setting cement is rammed into dry molds in the usual way. After about six weeks' hardening the blocks are strong enough for most building purposes. It is claimed that houses built with these blocks are fit for occupation immediately after completion, and that the inside of the wall requires neither cleaning nor preparation, but is ready for papering or painting at once.

SOUTHERN STOVE MANUFACTURERS' ASSOCIATION ADVANCE PRICES.

A meeting of the Southern Stove Manufacturers' Association was held at Chattanooga, Tenn., on February 5, when the subject of advancing prices was discussed. This resulted in a confirmation of the advances made by the Eastern and Western associations. The advances will probably be 5 per cent. on cast iron goods and 10 per cent. on steel ranges and oak stoves. The matter was referred to a committee for final adjustment.

THE STOVE TRADE IN NEW YORK.

Reference was made in these columns a week or two ago to the call for a meeting of the manufacturers who are interested in the sale of stoves in New York. This meeting resulted in the appointment of a committee who have now sent to manufacturers the result of their deliberations as to a basis on which an association can be formed. The situation at the present time seems to be one of apathy on the part of many on the outside, who seem to be waiting to see what the New York local manufacturers will do, without lending them any assistance or offering substantial encouragement. It is clear to some of the men who are well informed as to the situation that the New York manufacturers can do nothing except defend themselves against the outsiders who demoralize local conditions. To look the matter fairly in the face, New York has lost the capacity which it once had to readily dispose of the surplus product of all parts of the country. It is an equally pertinent fact that if New York continues to be an open market with a competition of the survival of the fittest type, the demoralization will not long be confined to its immediate territory. The prices which rule in New York City will become known sooner or later to buyers in other sections of the United States, and those who have been factors in producing the conditions in New York are likely to find troubles nearer home.

The stove manufacturers of New England, Pennsylvania, Western New York and the West all have an interest equal to that of the New York manufacturers in an improvement in the conditions in the local market, and they should be as active and energetic in working for the improvement as those on the spot, instead of enjoying better conditions in their own sections and waiting to see what will be done at this one point where prices are considered to be too low; for these prices may soon prevail over a wider scope of country. It is not strange that under the conditions some local manufacturers have little interest in the attempt to reorganize the old association or form a new one, and that they feel that their long experience will enable them to take care of themselves in a bitter struggle against those who are less advantageously located. The first step to success will be the establishment of the confidence which is so essential. The confidence now felt by many is of a feeble type, and of the defensive and hesitating character. If the interests which induced Secretary Hogan of the National Association of Stove Manufacturers to visit New York are really in earnest in the desire to have a change in the method of marketing goods in this territory, they will have to give better assurances to the New York manufacturers than have been received before success will attend any effort in this direction. The New York manufacturers will have to be impressed that the effort is an honest one before it secures their full cooperation.

R. Ward Hillman, who is well known to the Stove and heating trade in the vicinity of New York, has opened an office at 210 Water street, where he will represent the interests of Floyd, Wells & Co. of Royersford, Pa. Mr. Hillman has now the Irving Ranges and the Rosemont and Bengal Hot Air Furnaces as leaders, worthy of the attention of any buyer. In addition to these goods a catalogue of about 200 pages contains an exhaustive line of Cooking and Heating Stoves, well calculated to meet the requirements of all in the trade.

THE FURNACE TRADE.

Reports from various sections of the country show that the manufacturers of stoves very generally have reached the conclusion that their business should bring a better return, and as a result there has been a quite general advance in the selling price of these goods. A prominent Eastern furnace manufacturer, in a recent letter, makes the statement: "There is no doubt that the trade in boilers and radiators has been kept in a very satisfactory condition by means of co-operation; but it is unfortunate that the stove men, and especially the furnace manufacturers, cannot bring their views to accomplish the same results." The sale of stoves, in many instances, has been restricted to territory not very far distant from the manufacturing plant. The furnace, however, is capable of being sold in a wider territory. The difficulty in getting furnace manufacturers to arrive at a common conclusion may be due to their wide separation. This, however, is not sufficient excuse for some of the existing conditions. There can be no doubt, however, that the action of the stove manufacturers has led to the abandoning of some of the objectionable practices which had crept into the furnace trade. Owing to the increasing competition found with steam and hot water goods, furnacemen must necessarily advocate a better class of work, and those who make and sell furnaces will have to bear the brunt of this enterprise. If this work is as necessary as it would seem to be, it must be shared by the whole trade. This cannot be expected unless all engaged in the manufacture of furnaces support the effort and do their part. Before an effort to this end can be made successfully there must be a thorough discussion of the whole outlook, and it will be necessary for some men to devote considerable time to explaining it to other men who are less apt in taking up new ideas. Whenever those who have in view the betterment of the condition of the furnace trade, as a whole, are ready to take up the matter our columns will be freely open to a discussion of the subject.

Death of James Spear.

James Spear, president of the James Spear Stove & Heating Company, of Philadelphia, died on Thursday, January 30, at the Aldine Hotel, Philadelphia, where he resided. His death was indirectly due to an attack of the grip, contracted two years ago, which weakened his system so that he was unable to withstand the effects of a heavy cold with which he was recently attacked. Mr. Spear was born at Mauch Chunk, Pa., on February 17, 1827, and was descended from Scotch-Irish stock. He went to Ohio with his parents as a child, and moved to Philadelphia when about 21 years of age, entering the employment of North, Chase & North, stove dealers of that city. Subsequently he succeeded to a large part of the business of that concern, which he carried on under his own name until 1890, when the present concern were incorporated. Mr. Spear was widely known as an inventor of heating and cooking appliances, and patented a number of valuable inventions. Among his many important pieces of property of this class, was the anti-clinker grate, now in general use. Included in his later inventions was Spear's new cooking range, Spear's Twentieth Century cabin car stove and Spear's Twentieth Century car heater. Mr. Spear for many years was an elder in the Presbyterian Church, at the time of his death being connected in that capacity with the Wallingford Presbyterian Church. He also was a member of the Union League Club and served on many important committees of the Philadelphia Board of Trade. He was also actively interested in a number of charitable and philanthropic movements and institutions, and was a generous benefactor to the University of Pennsylvania. He leaves a widow, two daughters and one son. The funeral, which was private, was held on Saturday.

The Walker & Pratt Mfg. Company of Boston, Mass., last week notified the workmen of their factory, at Watertown, Mass., that beginning Monday, February 3, the plant would run on a 56-hour per week basis, without a reduction of wages, instead of the 59-hour week on which the company's foundry has been run for years past. This concession by the concern is greatly appreciated by their employees, who already enjoy many advantages not found with other similar concerns. For years the wages paid by the company have been as high if not higher than any other concern in their line. Their consideration for the comfort and well being of their employees is well known. The past year was a record breaker in the company's business and by far the largest in their history. It has been found necessary to make a second addition of 40 x 150 feet to the molding shop to accommodate the expansion of their business.

WHAT SHOULD A FURNACEMAN KNOW?

BY C. A. H.

In reading over the article in *The Metal Worker* of January 25, entitled "What Should a Furnaceman Know?" I notice the omission of one most important point, and that is the dust question. What I mean by the dust question is the dust carried into the rooms of a house with the hot air from a furnace. How can this be successfully overcome? If it should be overcome, the hot air furnace would have a much easier time in competition with steam and hot water. This is one of the things that furnacemen should know how to overcome, and I am satisfied that if those who have had some experience with this trouble would describe the methods that they have tried and the success that has attended them, many in the furnace trade would be interested.

Another thing that the furnaceman should know is how to advance the interest of that method of heating at all times. Selfish enjoyment of some method or device limits the benefit that is sure in the end to advantageously affect the whole furnace trade. Wherever a man does good work the popularity of the furnace system of heating is increased, to the advantage of all who are engaged in this class of work and all who manufacture hot air furnaces. If a furnaceman will take a broader view of the matter and co-operate for the improvement of furnace work and the building up of the popularity of the furnace system of heating, everybody will derive benefit from the effort.

Nothing Better Than Hot Air!

An enthusiastic supporter of the indirect system of heating sends us the following abstract from the *Yale Record*, the university organ, in which a lampooner of the faculty on general subjects has evidently touched up our correspondent:

There is another thing that seems rather overpriced, and that is heat. Ten dollars each to a pair of roommates for a capricious hole in the wall, $40 a room for the year. You could heat Hades at that price and save enough of it to give the devil his due. Forty dollars would buy 7 tons of coal, enough for a small house in any city, but Boston—enough to buy eight years' supply of firewood. (One can't take over that time to get through college.) When we have money to burn we want something better than hot air.

It is understood by our contributor that slang is the basis for the use of the words "hot air," but he desires it to be put on record that "there is nothing better than hot air" for warming places to be occupied by men. He sympathizes with the Yale man and joins him in the sentiment that the faculty should teach their pupils to be deferential to the best that has been discovered for heating and to avoid irreverent allusions to it even when giving the faculty a blast. He would impress on the young men at Yale that the heating man insures comfort in all habitations for half of the year and that those who provide for an endless current of pure, fresh hot air are public benefactors, who should be placed on a pedestal and not made the target of slang phrases, even at the faculty's expense. Doubtless all manufacturers and contractors for indirect heating apparatus will join in the hope that not only the students at Yale, but all university men, will acquire plenty of money, but that with its accumulation they will learn that for warming buildings "there is nothing better than hot air."

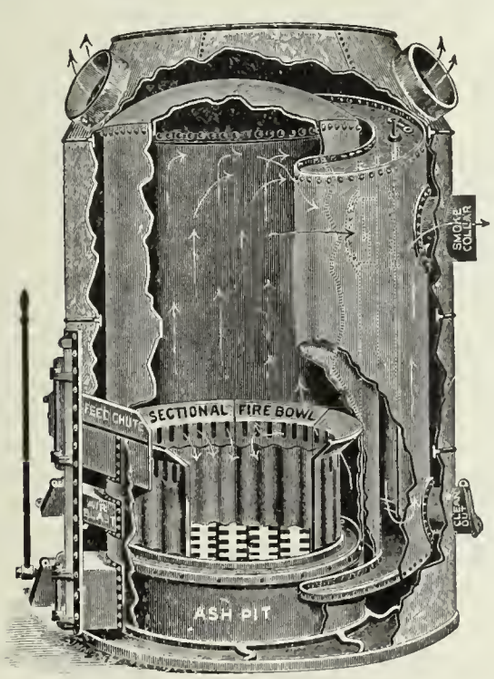
Annual Meeting of Co-operative Stove Company,

The stockholders of the Co-operative Stove Company, Bloomington, Ill., held their annual meeting last week at the office of the secretary. The gathering was of more than ordinary importance, owing to the fact that the question of doubling the capacity of the plant and largely increasing the force of hands was to be decided. The official business was the election of directors, which resulted as follows: E. M. Hamilton, C. A. Hamilton, John W. Hayes, E. C. Hewitt, A. C. Hamilton, Henry Capen, Frederick Riegger, Otto Seibert, William Partridge, E. E. Donnelly and J. W. Aldrich. The directors then organized by choosing the following officers for the ensuing year: President, W. Hayes; vice-president, E. C. Hewitt; secretary, E. M. Hamilton; superintendent and treasurer, A. C. Hamilton.

After the election the question of finance was discussed and the reports of the retiring officers presented. These showed the business to be in flourishing condition, but it was decided to put forth extra efforts the coming year and use every effort to increase the volume of business to still larger proportions. To this end it was decided to make extensive improvements and increase the capacity of the plant.

The Torrid Zone Furnace.

A broken view is presented in Fig. 1 of the Torrid Zone furnace, manufactured by the Lennox Mfg. Company, Marshalltown, Iowa. This is a steel furnace, specially adapted to the use of soft coal, but also capable of using hard coal to advantage. This furnace has a sectional fire pot, made of either cast iron or fire brick. The fire bowl is constructed with crevices or orifices around the top edge through which the heated air passes freely in jets into the combustion chamber, aiding in perfect combustion of the fuel, and largely preventing the formation of smoke when burning soft coal. The heating surface being vertical, the accumulation of ashes and soot on the heating surface is almost wholly prevented. This insures good radiation and a large saving in fuel. Iowa soft coal has been burned for a whole



The Torrid Zone Furnace.—Fig. 1.—Broken View.

season in one of these furnaces with less than a quart of accumulations from all surfaces.

The fire pot has no connection with the hot air chamber, being inclosed with a solid steel body, thus completely doing away with the danger of a leakage of gas or dust through a packed joint or cracked fire pot into the hot air chamber and then into the house through hot air registers. This fire pot, not being exposed to the hot air chamber, gives indirect radiation through the steel body and thus avoids overheating the air before it goes to the rooms above, as is likely when the air is permitted to pass over a red hot surface. Moreover, the fire pot being capable of separate removal through the fire door, in whole or in part, without disturbance of the casing, the user is not without a fire more than two hours and thus avoids tedious delays and annoyance, and the expense is less than half as much for a new fire bowl as where the casing must be taken off and the

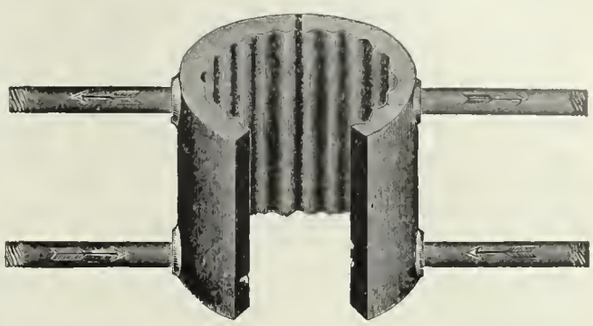


Fig. 2.—Water Heater for Combination Systems.

furnace and piping taken down in order to change the fire pot.

The furnace grate rocks like a locomotive grate, and is operated by a lever on the outside of the furnace. It is a practical shaking and dumping grate, being very simple and durable. It can be easily removed and replaced without disturbing other parts.

On each of these furnaces there is a diving flue, together with a direct draft that can be used when desired. The diving flue is crescent shaped and 42 to 48 inches high, according to the hight of the furnace, and is connected to the body of the furnace at the back by a self locking collar. The collar is made in two equal parts, one part fastened to the body of the furnace and the other to the diving flue before the furnace leaves the factory, and when the diving flue is set in place they make a connection similar to that of screwing a nut on a bolt by the locking of the two dovetails together, which enables a perfect connection at this point without the use of a bolt or key of any kind, and no matter how careless the workman may be.

The indirect radiator or diving flue is made with a hanging partition in the center of it that extends from the top down to 8 inches from the bottom. Near the top of this partition is placed a damper, and when it is closed the hot gases pass down the inner side to the bottom and return to the top on the other side. In this manner the heat is retained in the furnace that would otherwise pass out through the chimney and be lost. This indirect draft so materially aids the furnace in retaining its heat that no more heat passes out through the smoke pipe while there is a good fire in the furnace than is necessary to create a good draft.

This furnace can be converted into a combination hot water and hot air furnace by means of the water attachment shown in Fig. 2. This attachment is a hollow casting that takes the place of the fire bowl or lining in the furnace, and is heated by the fire directly against it. This manner of heating water overcomes one of the principal objections in combination furnaces: that of overheating water in extremely cold weather and not heating sufficiently in moderate weather. With this arrangement the water is equally well heated under all conditions of fire and weather. In other words, the heating surface for the water is not dependent upon the flash of the fire, but comes in direct contact with the hot coal, which makes it efficient at all times and all conditions of the fire. This is an important feature in combination heating.

The plant of the Prizer-Painter Stove & Heating Company of Reading, Pa., which was shut down for ten days to make necessary repairs, resumed operations on Monday, February 3. All departments are actively engaged and the outlook is promising for the coming season.

SOME HARD KNOTS IN FURNACE PRACTICE.

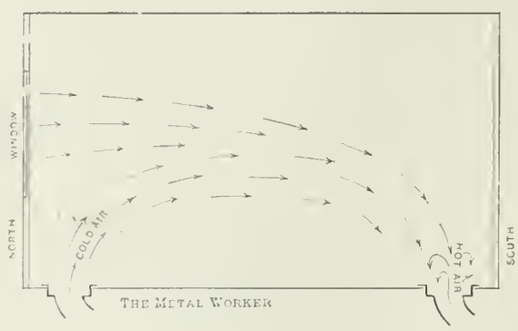
BY OLD ROSINHEAD.

I now have on hand two faulty furnace jobs to remedy, but they are none of my construction. I have been for the last eight or ten years very successful as a hot air furnace doctor, so to speak. Somebody else puts them up, and I have the fun of trying to make them work properly, if it is possible to do so.

The main causes of failure to work properly are: 1, improper location of furnace (some I find stuck away off in the south corners of a large rambling house, with the result that some of the rooms are naturally hard to heat, from the fact that they have northern exposure with large window area, and require pipes 30 to 40 feet long); 2, furnace not of sufficient capacity; 3, pipe too small to supply sufficient hot air to heat large, exposed rooms; 4, too much ventilation under the house; 5, too much ventilation in the rooms above; 6, too small cold air supply, and several other minor features.

The great trouble met with in handling one of these faultily constructed jobs is that people who are not disposed to pay for doing the job right, at the start, think you might do it in some other way that is not quite so expensive.

People have no cellars in this part of the country, and in some cases where a furnace is put up they only give you a hole under the house just large enough to drop a furnace into. When you tell them that it is necessary to move the location of the apparatus, then you get "sat



Some Hard Knots in Furnace Practice.

down on," sure. They cannot see why the furnace will not do just as well where it is. They are just like a man that I knew, who was sick and sent for a doctor. After four or five days the doctor saw he was not improving any, and began questioning him in order to find out what was wrong. The patient frankly told him that right at the start he had gotten the idea in his head that the doctor's prescriptions would not do him any good, and consequently he had not taken even one dose of the medicine.

The space is so cramped that in some instances you have almost to stand on your head in order to accomplish some parts of your work. Under one room in one of the jobs referred to there are four 18 x 36 inch ventilators open to the outside atmosphere. The other parts of the house are not quite so liberally provided with ventilators, but the temperature under the entire house is equal to that of a good ice house. Every room has a big open grate, and the heat from the furnace to the rooms downstairs chases itself up the flues so quickly that the furnace, being too small, cannot accumulate a supply of heat for the upstairs rooms at all. I tried to stop one of the grates by spreading a newspaper over the front. It slipped from my fingers, and the air pressure whirled it up into the flue equally as well as a Kansas cyclone.

Some furnacemen make all the short pipes as large as possible, while they make the long ones—those where the end is so far away that it is almost out of sight—as small as possible. I find some that would not make good water leaders.

I have one room that the furnace manufacturer says is air bound. I do not believe that I have ever seen a room that was built so tight that if a window was knocked out it would become air bound to cold air. I do not believe any one would tell you, "Oh, you need not mind that draft through the hole in the window; it will stop directly! There will be so much wind in here that no more can push into the room, and then the draft will stop."

Furnacemen say that a pipe to the north cannot work as freely as one in any other direction. Consequently they stop on the south side of the room, on account of retaining the pipe to short lengths. Result: If it is a north room there is a complaint of lack of heat; no heat, in some cases. In some instances you will find that it is carrying cold air to the furnace. Then you will hear some one say that it is air bound. The truth of the matter is the room is not air bound, but the south side is air compressed.

All so-called air bound rooms that have come under my observation are rooms with a northern exposure and having the register on the south side. One of these jobs, previously referred to, has such a room. But it has an open grate on the north; consequently it cannot be air bound in any sense of the word. The pipe is entirely too small, and only 8 or 9 feet in length. It cannot supply enough heat to overcome the intensity of the atmospheric condition of the extreme cold of the room. This is the room that has the four open ventilators under it. The illustration herewith shows the conditions to perfection. The currents of hot air have to "duck heads," "turn tail," and go back where they come from.

A Summer Stove Catalogue.

Catalogue No. 9, showing the Monarch line of summer stoves and ovens for gasoline, oil and gas for the season of 1902, has just been issued to the trade by the Monarch Stove & Mfg. Company of Mansfield, Ohio. The title page is followed by a full page view of the company's manufacturing plant. The opposite page gives the address of their various branch offices in New York, Philadelphia, Pittsburgh, Chicago, St. Paul, Des Moines, Lincoln, Neb.; Cincinnati, Kansas City and Denver. The early pages are devoted to the Monarch cabinet steel range, made with a 20-inch oven and five giant top burners, with a lift out top flush grate equipped with five cooking burners. These stoves are shown with right and left hand side cooking extension, are provided with non-corrosive feed, and are mounted on casters. Several pages show the Monarch New Method or evaporating process stove, with two and three burners, with and without end step and cooking burners. The generating or Old Method Monarch stove is also presented in a variety of styles, and the company's Junior stoves are shown in both high and low pattern of cabinet construction. These stoves are followed by an equally extensive, attractive and varied line of wickless blue flame oil stoves, made in both cabinet and high form and as Junior stoves.

The next section of the catalogue is devoted to the Monarch asbestos lined oven with drop door. These ovens are so made that they can be shipped in a knock down form, insuring their safe delivery without damage in transit. The concluding pages of the catalogue are occupied by some of the especially attractive gas heating stoves adapted for both natural and artificial gas, which the company put out under the name Monarch. At the end of the catalogue are given suggestions for ordering repairs, in order that mistakes may be avoided. The various parts are numbered on special cuts, and the price of the parts are also given in the catalogue.

THE trade will learn with regret of the sudden death of John D. Graff, a member of the well-known Stove house of Graff & Co., 909 Liberty street, Pittsburgh, Pa. Mr. Graff was born in Allegheny 37 years ago, and was the son of Thomas J. Graff, one of the pioneer Stove manufacturers of Pittsburgh, who, until his death in 1890, was a member of the firm of Graff, Hugus & Co. The firm continued until the consolidation a few years ago, when the Pittsburgh Stove & Range Company were organized. At that time John D. Graff was in charge of the plant at Sharon. From there he went to Monongahela City as manager. His successor is William Graham. Mr. Graff leaves a widow and three daughters.

The Stearns Molding Machine.

At a recent meeting of the Philadelphia Foundrymen's Association W. M. Potter of E. C. Stearns & Co., Syraeuse, N. Y., read the following paper on the Stearns molding machine:

Among the many mechanical arts that of molding in the sand is one of the last to suecumb to the uses of machinery. Steadily has machinery aided man in the produetion of the manifold wares demanded by civilization. Steadily has the prejudice of the worker given way until now, I think, among the last to aeknowledge and recommend the use of machinery is President Fox of the Molders' Union, who says that he indorses the use of molding machines and advises molders to learn to use them.

The molding machine which I have here, which I wish to demonstrate to you and to which I invite your inspection and attention, is of the class termed by some "squeezers," for the reason that it does nothing but press the sand and takes the plaee of the hand rammer. Other types of molding machines have their place and usages, sueh as the stripper plate type and others where the pattern is drawn by mechanical means. These machines, however, are mainly adapted to the production of pieces that are alike on both sides of the pattern—that is, the cope and the nowel are alike—but they are not well adapted to the various usages where snap flask or bench work is done in general foundry praetiee.

In order to put in use the Stearns molding machine nothing different in the way of flasks, patterns or follow boards is required; the only ehange neeessary being that the bottom boards should be made a loose fit, say, ¼ inch in length and in width smaller than the inside of the flask. I wish to say here that this machine is only intended for the use of manufacturers producing work in snap flasks on the bench, and it will not help a jobbing foundry where only a few castings at a time are made.

For the economical produetion of snap flask work the molding machine is indispensable to the modern foundry, and it has been the aim in the design of this machine to reduce the number of parts to the minimum, and also to so increase the leverage that the least exertion possible is required to operate it, so that a molder can produce a larger amount of work in a given time with less fatigue. Aside from the question of the reduction in the cost of molding the most noticeable feature in the use of the molding machine is the uniformity it produces in the castings. In the case of many castings that are made in our foundry, such as lawn mower wheels, where the wheels have an internal gear, the molding maehine added materially to the uniformity of this work, and in other instances where small pieces of hardware are required to assemble without machine work the molding machine has produced a uniformity in the work that was not even appreciated by ourselves.

I have here a casting of a card hinge pattern that we make in large quantities. I have taken this just as it left the sand, and before it enters the tumbling mills. in order to show you an illustration of what I refer to. This card of patterns is 8 x 20 inches. A molder operates 100 molds per day, and is pald at the rate of 2 cents per mold for all good castings that pass inspection and assemble properly. Most of this small hardware work is made not by molders, but by either apprentices or young men who have not worked long at the business. We believe it is a conservative estimate to say that from 25 to 33 1-3 per cent. more work can be accomplished with the use of machines than without them. Of course, this is for such pieces as the machines are adapted to. In this eonnection we wish to say that there are many pieces that are made on the bench for whieh we would not recommend a machine, as they can be done better by hand. This machine is so designed that the platen when thrown baek forms a regular bench that a molder can work on by hand and not use the machine portion of the ramming mechanism.

The increased output naturally decreases the cost of manufacture, making the machine pay for itself in a short time. In addition to the saving effected in the cost of castings, it is easier for the molder to produce his work. If paid by the piece he will earn considerably more per day than he would in putting up his molds with rammers, so that the manufaeturer can, if he wishes, afford to divide part of the saving with the molder. The molding maehine is of benefit both to the employer and the employee. The molder is as anxious to inerease his wages and lessen his labor as the manufacturer is to get a larger quantity with more uniformity and at a lower cost.

The Stearns molding machine is so simple in construction that no complicated instructions are required to learn to operate it, even by those not familiar with molding machines. This advantage will be readily understood by all foundrymen. In our own foundry we have had instances of men who had never seen the inside of a foundry commence work on a Stearns molding machine, and in three weeks put up 150 molds per day of an average elass of work in a flask of ordinary size.

I also have here brass patterns from the master patterns, so smooth that little or no work has been required in making the card of patterns. Formerly it cost from $30 to $50 to make a card of fine brass patterns such as these hinges. These are now by careful molding made smooth enough to require but little work in making the patterns. Any one producing a large quantity of pattern work can make great savings in this direction. I should be glad to give anybody information on this subject that feels interested in it. You may appreciate how little there is done on patterns when I show you these. When they break off from the gate, as we all know they do constantly where patterns are in frequent or continuous use, we simply mold these over and solder on new pieces rather than take the trouble to let in sheet metal gates.

In order to fully illustrate the foregoing paper Mr. Potter had on exhibition one of the molding maehines in the praetieal operation of making molds; various castings were also exhibited to show the class of work capable of being made on the maehine. In the course of the diseussion whieh followed the paper Mr. Potter said that the basis of price per mold as stated in his paper, 2 cents each, was probably a eheaper rate than would have to be paid in this neighborhood, but they had no diffieulty in getting the work done at those figures in their own foundry.

The Thatcher Furnace Company.

In accordance with the custom in New York City, the Thateher Furnace Company of 240 Water street have heretofore maintained a shop for the installation of heating apparatus. The growth of their business has now made it necessary that their entire attention be devoted to the wholesale trade. In consequence, at the first of the year the company sold out their tin shop and equipment to W. A. Lassin, 101 Beckman street, and they will hereafter install no furnaces or ranges. This no doubt will be regarded by the trade as a step in the right direction, as there has always been more or less objection to wholesale houses doing construction work. The Thateher Furnace Company by this new step will be enabled to push the Thatcher line with an increase of their characteristic energy. During the past year the company have added to their line of hot air furnaces, so that they now have heaters adapted to the requirements of all classes of trade. They have also completed their already extensive line of single and double oven ranges adapted for the cheaper building operations, and also for the finest residences of high class custom trade. The Thatcher line of steam and hot water heaters are equally complete. The company have extended their foundry at Newark, N. J., and other buildings and equipments so as to give them a greatly increased producing capacity and excellent facilities for filling orders promptly and shipping by the most direct route. The company now feel that they have, in the Thatcher line, goods in every way worthy of the attention of the most careful buyers, and they will now devote themselves exclusively to bringing their merits to the attention of the trade only.

ODD PLATES.

A. J. Lindemann of the A. J. Lindemann & Hoverson Company, Wilwaukee, Wis., who is spending a few days in New York, was a visitor at *The Metal Worker* office this week. He reports that the company, in addition to making an excellent line of Gasoline Goods, are now also prepared to furnish a fine line of Cooking Stoves and Ranges, Heating Stoves and Oaks for burning both coal and wood.

We have received from the Eclipse Stove Company, Mansfield, Ohio, a copy of the new calendar that they are distributing to the trade. The present calendar contains the first four months of the year. A second edition, comprising the remaining months, the company state, will be issued by May 1. On the upper part of the first page is given a view of the company's extensive Stove works, and the following monthly pages are headed by illustrations of some of the goods which have made the name Eclipse significant of all that is desirable in Stove and Range construction.

The S. Obermayer Company, Cincinnati, Ohio, with branch factories at Chicago, Ill., and Larimer, Pa., state that the year 1901 has proven to be the banner year in the sales for Foundry Facings, Supplies, &c., and the prospect for the current year, judging from the orders already in hand received during the month of January, bids fair to exceed any similar period in the history of their business. The company have recently established a branch at Pittsburgh, Pa., which will be operated in direct connection with the plant at Larimer, Pa. This move is an especially important one, as it places them in much closer touch with a territory of trade than heretofore enjoyed.

The Born Steel Range Company of Cleveland, leading manufacturers of Steel Ranges, are contemplating the erection of a large plant. An option has been obtained on a large building site in Newburg, near Cleveland, and the matter of erecting the plant is in the hands of a building committee, who are not yet prepared to announce their decision. If the new plant is built, the present large factory at Brooklyn will become a branch works.

The Mount Penn Stove Works, Reading, Pa., have resumed operations after the usual shut down for inventory and repairs.

The Mississippi Valley Stove Company, Fulton, Ill., manufacturers of Solar Stoves and Ranges and Bair Retort Down Draft Furnaces, have favored us with a beautiful wall calendar, consisting of a card of unusually large size, bearing a half-tone, reproducing a famous picture, "The Flight of Time." Attached to this card are leaflets for the months.

Oliver White, superintendent of the Stove works of Rathbone, Sard & Co., at Albany, N. Y., left on February 1 for Aurora, Ill., where he will assume charge of the extensive plant of the company in that city.

L. H. Solosth & Sons Stamping Works, successors to the Ornamental Stamping Works of Grand Rapids, Mich., advise us that they are manufacturing the World's Best Blue Flame Kerosene Oil Stove, for which they have succeeded in securing a large demand in their vicinity. They are also manufacturing a line of Stove Boards in addition to their regular product of ornamental sheet metal work.

Referring to the notice in our issue of January 25 of the division of profit with their employees made by the Scranton Stove Works of Scranton, Pa., the concern advise us that the 165 men referred to in the item in question as having benefited by the scheme did not include all the men in the employ of the company. Only this number out of a total of 275 employees qualified as recipients of the dividend under the terms of the plan. This profit sharing plan, the company claim, is an entirely original one, no similar scheme ever having been in force elsewhere, so far as known by the management of the Scranton Stove Works.

The Crystal-Garland Range is the interesting theme of an attractive circular just issued by the Michigan Stove Company. This is a six-hole Cast Range, adapted to soft coal or wood. It is presented to the trade as the latest creation of the company in the Cast Range line. Its appearance indicates that the pattern maker has endeavored to surpass himself in the design of the molded work and decorations. This Range is furnished with or without reservoir, is made on the interchangeable reservoir system, enabling merchant or consumer to change from square to reservoir at pleasure, and is also made in every size, style and kind known to modern Range construction. It has an aerated aluminized steel oven, draw out grate and combined pouch feed and broiling door.

G. L. Hergert, 210 Water street, New York, is exhibiting the Orelup Patent Attachment for increasing the efficiency and economy of Furnaces and Stoves. This consists of a special construction of Drums, and has been patented by A. Orelup, 1352 Groveland avenue, Chicago, Ill.

The Right of Discharge Upheld.

A recent decision of the Supreme Court of Ohio in the case of the Nickel Plate Railway *vs.* Frank Shaffer, involving the use of the "black list," sustains the position of the railroad company. Shaffer was discharged by the company for participating in a strike. He claimed that he could not secure employment on any other road because the company refused to give him a certificate of service, and he sued for damages. The Circuit Court pronounced a judgment in favor of Shaffer, which judgment has just been reversed by the Supreme Court, the ruling of which is as follows:

A master is under no legal obligation to give to his discharged servant a statement of his service and whether or not it was satisfactory, and a discharged railroad employee cannot maintain an action for damages against the company who discharged him for refusal to furnish him with a clearance or statement of the record of his service, although he may have been unable to obtain other employment in consequence of such refusal by the company.

It is the right of every person, natural or artificial, to employ or refuse to employ in his business whomsoever he may wish, and he cannot be called upon to answer for his judgment in that regard by the public or individuals, nor can the motives which prompt his action be considered. A railroad company may lawfully refuse to continue in their employ a person who has engaged in a strike affecting their interests, or who has shown himself to be negligent, incompetent, inefficient or dishonest.

Proposed Permanent Exposition in Mexico.

The project of establishing a permanent exposition of native and foreign products in the City of Mexico, which has been under consideration for some time, is likely, says United States Consul William W. Canada of Vera Cruz, soon to be an established fact. A contract has been signed between the Mexican Government and José Landeros Cos. representing a company, by which a concession is granted to the latter to establish a permanent exposition, the buildings for which shall be finished within three years and cost not less than $300,000 in Mexican currency. The concession is for a period of ten years. The agreement has already been approved by the lower House of Congress, and it is expected that it will meet the approval of the Mexican Senate.

The administration of the exhibition will promulgate its rules and regulations, approved by the Government, in English, French, German, Spanish and Italian. A yearly catalogue is also to be published in the same languages, containing a descriptive list of all the articles exhibited. All material necessary for the construction of the buildings, as well as samples of foreign products, will be admitted free of duty under a bond guaranteeing that they are for the use of the exhibition only. Any samples so imported which have not been sold or re-exhibited within one year will, however, be assessed the usual duties. All articles sent for exhibition must be accompanied by a statement giving the name of the manufacturer or producer, or his agent, the name of the article, its application, price and all other necessary data.

Features of the Peerless Refrigerators.

The Wisconsin Refrigerator Company, Eau Claire, Wis., have introduced a number of special features in their Peerless line of refrigerators, which are herewith illustrated. Fig. 1 shows a refrigerator with the door

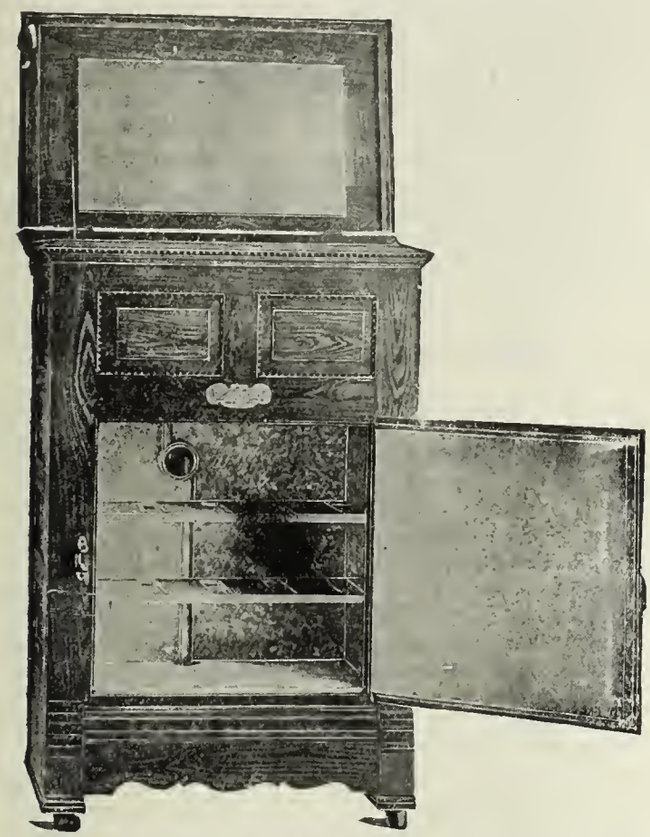


Fig. 1.—Peerless Refrigerator.

to the provision chamber open, to enable the arrangement of the interior to be seen. Fig. 2 illustrates the new drain pipe and drip cup. The drain pipe and drip cup are removable for cleaning, by raising the cup enough to release it from the lower pipe and giving the

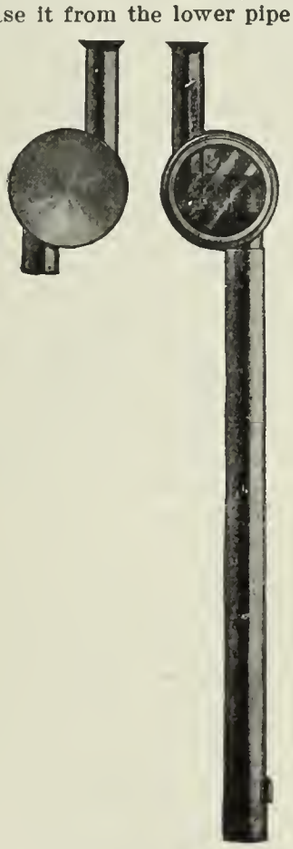


Fig. 2.—Drain Pipe and Drip Cup.

cup a half turn to the left. The upper and lower pipes can then be easily removed. The cup is circular in shape and is constructed so as to form a trap. It fills with the drainings from the ice and overflows into the downward pipe, thus preventing the possibility of cold air escaping from the ice chamber or warm air entering from the outside of the refrigerator. The cup has a glass front, which enables the interior to be easily inspected, so that any collection of refuse can be detected which might clog the pipe and cause water to overflow into the provision chamber. Fig. 3 shows the improved ice rack, which is made entirely of metal and braced and riveted in such a manner as to give the greatest possible strength. The arched shed under the center of the rack, covering the opening directly entering the provision chamber, is constructed so as to prevent the drippings from condensation passing into the provision

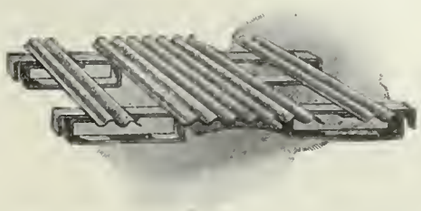


Fig. 3.—Improved Ice Rack.

chamber, and its open construction to give the quickest possible circulation of dry air to the food in the provision chamber below. Fig. 4 shows the new cleanable flue wall. This is a flue within a flue. The square hollow device attached to the center and inner side of the wall is a reinforcement to the wall, giving great strength, and acts as a second draft, greatly aiding in the rapidity

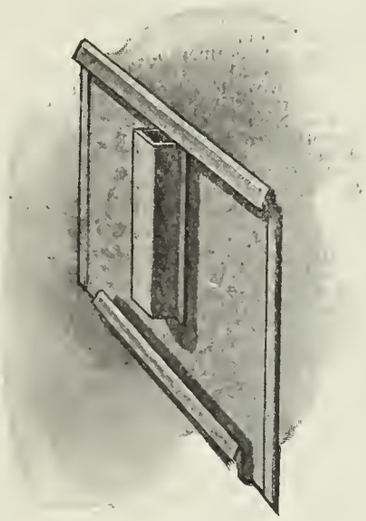
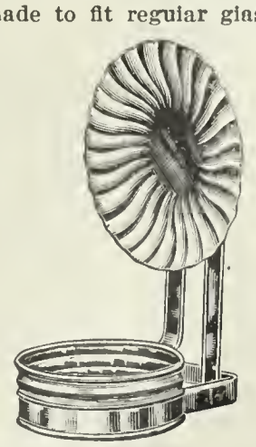


Fig. 4.—New Cleanable Flue Wall.

of the circulation. The upper edge of the wall is shaped inward and extends over proper points at the top, holding it in its final position. The bottom of the wall is shaped so as to carry off all condensation direct to the drain pipe.

The Utility Lamp Bracket.

The accompanying cut shows a lamp bracket offered by the Utility Mfg. Company, 16 S. Frederick street, Baltimore, Md. The bracket is provided with a reflector, and is made to fit regular glass founts. It is



The Utility Lamp Bracket.

japanned a glossy black, and is referred to as being strong and neat. The brackets are packed one gross in a case.

THE PACIFIC RETAIL HARDWARE ASSOCIATION.

The fourth annual meeting of the Pacific Retail Hardware Association convened at Nevada City, Cal., January 15 and 16. Nevada City being a town in the Sierra Nevadas, it was feared that storm conditions might interfere with the attendance, but the weather was unusually pleasant, and the attendance of retail hardware men, manufacturers and others interested was large, the meeting proving a highly satisfactory one. The convention was called to order by the president on Wednesday morning at the Masonic Hall, the following firms and members responding:

Adkins & Drane, Red Bluff.
R. M. Beebee, Gridley.
Bills & Putnam, Oroville.
Billiou & Applegate, Saint John.
J. P. Burbank, Anderson.
J. E. Boorman Hardware Company, Marysville.
R. B. Cranston, Woodland.
Ed. G. Carter, Cottonwood.
W. M. Doty, Biggs.
Denny-Bar Company, Scott Valley.
Elam Biggs Hardware Company, Grass Valley.
Epplnger & Co., Dixon.
Estate G. W. Freeman, Willows.
J. Grover, Colusa.
B. P. Grover, Williams.
T. B. Gibson, Woodland.
Hampton Hardware Company, Marysville.
L. L. Hubbell, Chico.
Hubbard, Earll & Co., Chico.
Robert J. Hancock, Auburn.
Hochheimer & Co., Germantown.
John Haenny, Lincoln.
L. O. Johnson, Arbuckle.
J. D. Johnson, Dixon.
R. O. Kimbrough, Sacramento.
Kaufman Bros., Corning.
H. D. Knight & Bro., Elk Creek.
Estate J. P. Klemmer, Willows.
Legg & Schaw, Nevada City.
Lyon & Garrett, Red Bluff.
McCormick-Saeltzer Company, Redding.
J. A. McFeely, Chico.
Mitchell & Son, Colusa
C. J. McBride, Lincoln.
A. L. Nichols, Chico.
R. Noell, Grass Valley.
Scribner & Murdock, Orland.
John L. Swank, Colusa.
John Simpson, Tehama.
A. C. Stagner, Wheatland.
Benjamin Smith, Maxwell.
Lewald & Schlueter, Fresno.
Geo. E. Turner, Nevada City.
White, Cooley & Cutts, Marysville.
H. A. Scribner, Durham.
W. E. Hawkins, Ager.
H. G. Dorsch, Quincy.
M. Q. Meehan, Placerville.
Pioneer Hardware Store, Placerville.
E. L. Reid, Junction City.
Fred. A. Autenreith, Yreka.
S. Swect & Co., Visalia.
Dinkelspiel Bros., Bakersfield.
Redlick Bros., Bakersfield.
L. N. Wood, Visalia.
Linder Hardware Company, Tulare.
Bakersfield Hardware Company, Bakersfield.
A. Young, Tulare.
Barrett-Hicks Company, Fresno.
Donahoo-Emmons & Co., Fresno.
Turner Hardware Company, Modesto.
W. B. Wood & Son, Modesto.
Ruhl Stove & Hardware Company, Stockton.
A. Watkinson, Corning.
E. F. Reichman & Co., Fort Jones.
Brady & Cassidy, Grass Valley.
G. H. Knight, Adin.
Bird & Dinkelspiel, Colinsville.
Thomas Jones, Hornbrook.
E. B. Cavanaugh, Edgewood.
Ophir Hardware Company, Oroville.
Francis & Johnson, Auburn.
Owen Sullivan, Colusa.
Lord & Murray, Woodland.
J. F. Brown, Rio Vista.

Delegations from the San Francisco and Oakland Retail Hardware Association and from the newly formed Central California Association were also present. After an address of welcome on behalf of the citizens of Nevada City and Grass Valley by George A. Legg, the president, John C. White delivered his annual address, which was of an interesting and encouraging tenor. The report of the Executive Committee, which was read by Vice-President Oscar C. Schultze of Dixon, Cal., showed the association to be in a flourishing condition. Mr. Schulze subsequently read a very interesting paper on "Reciprocity in Trade." Among other papers which were read and discussed were one by G. A. Gutman of Germantown, Cal., on "Suborganization," and an interesting paper on the "Social Side of Business Life," by A. F. Brady of Grass Valley. These papers were kindly received by the convention, and a vote of thanks tendered those who prepared them.

The city of San Francisco was selected as the place for holding the fifth annual meeting, when it is the expectation and aim to hold a joint convention of all the retail hardware associations in the State of California.

The following officers were unanimously elected to serve for the ensuing year:

John C. White, president, Marysville, re-elected.
Oscar C. Schulze, vice-president, Dixon, re-elected.
Wm. Earll, treasurer, Chico, re-elected.
Robt. W. Boyd, secretary, Marysville, re-elected.
A. F. Brady, member Executive Committee, Grass Valley.
T. B. Gibson, member Executive Committee, Woodland.

The chairman reappointed the Auditing Committee, consisting of Elam Biggs, Grass Valley, Cal.; John Simpson, Tehama, and J. F. Sersanous, Willows, Cal.

The convention closed with a banquet. The meeting was a notably, successful one, and the association is to be congratulated on its position and influence.

Stove and Hardware Dealers.

The Chicago Solar Light Company, manufacturers of the Nulite Incandescent Vapor Gas Lamps, 132 to 134 Lake street, Chicago, state that the demand for their Lamps has grown beyond their expectations. The increase in their business has more than quadrupled in a year. They believe that this increased demand for their Lamps has been caused by the excellence of the workmanship. They have just issued interesting circulars which give a full description of the variety of Lamps which they have brought out and the special features of each style of construction. The variety shown comprises Table Lamps, Student Lamps, Single Pendants, Chandeliers for 2, 3 or 4 lights, Wall Lamps, Street Lamps, Outdoor Arc Lamps and Indoor Illuminators.

The W. J. Clark Company, Salem, Ohio, are sending out their catalogue No. 4 of 40 pages, descriptive of their Quick as Wink Hose Coupling, which can be adapted to a great variety of uses. It is stated that the small sizes of these Couplers are extensively sold to users of compressed air for use on hose connected with pneumatic tools and machines. The catalogue is copiously illustrated and gives numerous testimonials from fire department officials, large manufacturing plants, &c.

F. J. Knesek, Moulton, Texas, dealer in Hardware, Tinware, Crockery, House Furnishing Goods, &c., requests that copies of catalogues, price-lists, &c., be sent to him in regard to the above lines. Mr. Knesek was formerly in business in Schulenburg, but has lately moved to Moulton, where he had just completed a new building when it was destroyed by fire. Mr. Knesek had not, however, moved in his stock, which was thus saved from destruction. He has already contracted for a new building to be made ready with all possible haste.

A patent was recently granted to P. A. Myers of the firm of F. E. Myers & Bro., Ashland, Ohio, for an improvement in Horizontal Force Pumps, which is said to simplify the construction in a great degree and covers broadly the feature of grouping the suction and discharge valves in such a manner as to render them readily accessible. The patent covers the line of Century and Bulldozer Pumps manufactured by F. E. Myers & Bro.

The White Mountain Freezer Company, Nashua, N. H., have just issued a finely printed descriptive catalogue, illustrating the various forms of the White Mountain Freezer, together with illustrations and reference matter of the various parts for repairs. In it are shown Hand Freezers, with both crank and fly wheel; Freezers for hotel and confectioners' use, Combination Gear Frame Freezers, Platform and Power Freezers and the Junior or Toy Freezer. The latter will make a pint of perfect cream to amuse the little folks or supply the sick room. In the back are shown Freezer and Packing Tubs and Cans and the Improved Arctic Freezer, the latter a single motion machine more moderate in price. On the covers, front and back, are White Mountain views. The catalogue will be sent to any interested dealer on application.

The Smith Mfg. Company, Waynesboro, Pa., have had their new manufactory upon which they entered last May running to its fullest capacity ever since, and have

contracts secured that will keep them fully engaged up to May 1. At present they are making $25,000 worth of Galvanized Ice Cans for the Frick Company, Waynesboro, Pa., and $3000 worth for the Crystal Ice Company, Kansas City, Mo. They have also a number of other smaller contracts that will totalize $30,000.

S. I. Newcomer has bought the McKibben Hardware, Stove, Agricultural Implement and Sporting Goods business, at Lanark, Ill., and will continue it on a cash basis.

The St. Louis Retail Stove and Hardware Dealers' Association, in conjunction with the manufacturers and jobbers of the city, will tender a banquet to the members of the Missouri Retail Stove and Hardware Dealers' Association, whose annual convention will be held on the 18th and 19th inst. The banquet will be given at the Mercantile Club, St. Louis, on Wednesday evening, 19.

The sixth annual convention of the Wisconsin Retail Hardware Association was held at the Republican House, Milwaukee, on Wednesday and Thursday, February 5 and 6.

A Market Phenomenon.

The reported action of the steel manufacturers in deciding not to advance the price of soft steel bars emphasizes the peculiar conditions which now prevail in the iron and steel trades. Here we have the unusual spectacle of a meeting of manufacturers, undoubtedly called for the purpose of agreeing upon an advance, and with everything favoring such a decision, agreeing not to do so. It is a most unexpected position to take, as the trade had been prepared for the announcement of higher prices by the stiffening of quotations generally and by the increasing difficulty in finding manufacturers able to take orders for reasonably early delivery. It can safely be assumed, with no precise knowledge of the proceedings of this meeting, that the decision not to advance prices is due to the attitude of the largest manufacturers rather than to the conservatism of the rank and file. While this attitude is commendable for most important considerations, it is such a departure from the usual course of market events as to be noteworthy. It is, however, in conformity with a number of other occurrences during the past nine months in which prices of steel products have not been adjusted according to general expectation. They have not been marked up when conditions seemed to perfectly justify such a procedure, and they have sometimes been marked down when but for such action they would have gone soaring. A new era, therefore, seems to have dawned. It is an era in which present profit is not considered so much as the cultivation and preservation of a sustained demand. The remarkable circumstance is presented, and indeed has for some time confronted us, of order books filled to overflowing, with finishing departments hungry for more material, while prices show little evidence of the existence of more than a fair demand.

This has caused the iron and steel market to be really stronger than it appears. Such a market phenomenon as this has been known before, but only for a brief time and not on any great range of products. In the early stages of a boom it is manifested, of course, but otherwise it has only occurred when temporary conditions restricted the supply of some particular commodity. Never before, during a period of absolute freedom from excited buying, has this phenomenon of extraordinary market strength existed to such a great extent as now obtains. In pig iron, bars and structural material particularly the published quotations of prices asked by manufacturers are for deliveries which are hopeless for the buyer who finds that he will shortly need additional supplies. In the steel rail trade the same prices are quoted as were current months since, but not a mill can be found in position to guarantee delivery before October. The strength of the rail situation is most convincingly shown by the prices now being paid for relaying rails. Such rails, partly worn, and usually sold at 25 per cent. less than new rails, are now worth the full price of new rails.

It is true that in a few lines, such as sheets and tubes, the multiplication of new mills has proceeded so rapidly of late that prices are not so strongly held. Taking the steel trade as a whole, however, the volume of business now in progress is so great that when weakness does develop in one branch it is not likely to become acute but will speedily correct itself. This was the case in wire products. What happened in that line is likely to be repeated in the others. The general volume of business is so large, and has been so well sustained by the policy of maintaining reasonable prices, that the supply of raw materials is not running in excess of the demand and therefore they are not cheapening in price. This keeps up the general cost of manufacture and prevents the slaughter of values in any branch in which the product may appear to be exceeding the demand. High cost and low selling price are not conducive to serious attacks on the market. A great balance wheel is thus in operation, which checks a boom.—*The Iron Age.*

The Commercial Element in the Trade School.

The value of the commercial element in the trade school, says George I. Alden, in the *Southern Workman*, is shown in three respects. First it furnishes the best standard with which to test the work of the student. The commercial standard is best because it is the one to which the student must conform in the practice of his trade, and the efficiency of the trade school in this particular line will be judged by the ability of its graduates to meet readily and quickly the commercial requirements of the trade which they have been taught.

But the commercial element in a trade school is valuable also because it secures the best development of the pupil. The idea that a trade can be better acquired or the pupil better trained by working on useless pieces or designs than by practice on real work demanding commercial standards, will not be likely to revive until medical students are excluded from hospitals where people are sent to be treated and allowed to take their practice in the laboratory and deal with skeletons, manikins and dead bodies, rather than with living patients.

The commercial element may also have a pecuniary advantage. In the construction and furnishing of buildings or in making articles for sale in the market the students in the trade schools may be more or less profitably employed.

If the commercial element in the trade school may be so used that 1. it sets a better standard for the students' work; 2, gives the student better training of all his faculties, mental and physical, and 3, may be made of financial advantage to the school, then its importance can scarcely be overestimated.

TRADE NOTES.

The National Gas Saving Company, with a capital of $25,000, have been organized at Baltimore, Md., with Charles H. Hershey, president; C. E. P. Brewer, vice-president; Thomas M. Dukart, secretary, and C. M. Harkins, treasurer, to manufacture a patented Gas Saving Tip.

The Canton Roll & Machine Company, Canton, Ohio, have more than doubled their capacity during the past year and are turning out from 75 to 80 tons of castings per week. They are about to commence work on another addition.

The Southern Asbestos Mfg. Company, Richmond, Va., are about to make extensive improvements and enlargements at their plant.

G. R. Lynch, who has been general manager of the Chattanooga Steel Roofing Company, Chattanooga, Tenn., for 11 years, has resigned to accept the management of the Aurora Acetylene Company, manufacturers of Aurora Acetylene Gas Generators. They have one of their machines on exhibit at Charleston, S. C., which is attracting much attention, we are told. The Steel Roofing Company grew rapidly under the management of Mr. Lynch and are now one of the largest manufacturing concerns in Chattanooga. On Mr. Lynch's retirement the employees presented him with a very handsome silver tea set.

A Protection Circular.

The following circular, which is being sent to the plumbing trade, is interesting in view of the fact that both the plumbers and the wholesale trade are acting under special sets of resolutions which are somewhat at variance:

National Association of Master Plumbers of the United States.

THE NATIONAL ASSOCIATION OF MASTER PLUMBERS STANDS FOR PROTECTION OF MEMBERS ONLY.

A CONTRAST.

Formerly gas fixture dealers were the exclusive dealers in gas fixtures. To-day department stores, hardware merchants and gas companies sell these goods, and the owner or contractor can buy anywhere and have the work done by journeymen. Why?

There was a time when the master painter sold nearly, or all, the paints used. To-day you find paints on sale everywhere, and the former master painter simply a journeyman. Why?

Druggists to-day are obliged to compete with the department store, the retail grocer and the "cure-all doctor." Why?

Carpenters, masons and plasterers once protected. Now the owner or agent can buy at wholesale, while the masters simply do the labor. Why?

DO YOU KNOW THE PLUMBING BUSINESS IS THE ONLY BUSINESS PROTECTED, AND NOT CUT INTO BY OUTSIDERS? IT'S A FACT, THOUGH, AND THAT IS JUST WHAT

THE NATIONAL ASSOCIATION OF MASTER PLUMBERS STANDS FOR; PROTECTION TO ITS MEMBERS.

That's the reason why you should be a member and share in the benefits it brings to the master plumber.

FROM A BUSINESS STANDPOINT

every master plumber should be a member, for the Cleveland Resolutions confer distinct benefits upon members, which are not enjoyed by nonmembers. Have you read the resolutions? If not, ask for a copy.

RECOGNIZED MASTER PLUMBERS.

The Cleveland Resolutions provide that in localities where there are members plumbing goods shall be sold only to master plumbers who are recognized by the National Association as master plumbers, and whose names appear in the National Directory.

To illustrate, take a locality where there are no members, and the jobber or master plumber sells to the consumer, the nonmember would receive no redress. He must see his legitimate profits lost, for he has no right to complain.

BAD DEBTS.

Sections 6, 7 and 8 bring just the protection every one wants. If you are a member you are protected.

ESTIMATES AND DISCOUNTS TO CONSUMERS

by manufacturers or jobbers are condemned and the member is protected, while in localities where there are no members the plumber would surely have trouble with his customer and his trouble would be all his own.

NON MEMBERS

must not expect the National Association or its members to interest themselves in the welfare of those not sufficiently alive to the best interests of their business success to become members of the association that protects members. E. D. Hornbrook, President.

Kansas City, Mo.

Cleaning Small Sewers.

In reply to a correspondent of *Municipal Engineering*, Warren Goodrich of Whitehall, N. Y., contributes the following on the size of small sewers and the cleaning of them:

In the first place, your 6-inch pipes are too small for any practical use as a public sewer. Nothing less than 8-inch should be used for public work. Perhaps the grade is at fault. I always try to obtain a grade of at least 1 inch per 50 feet, if possible. Perhaps too much surface dirt is allowed to drop into the pipes, and I have found that nothing clings to the inside of a sewer pipe worse than sand or ground stone that has been crushed by wagon wheels. If the blockade is caused by roots nothing will cure it except relaying the pipes and making the joints perfectly tight with the best cement.

Now, to remove the obstruction, if you have a water system with good pressure, or any means of forcing water into the pipes, take one length of hose, cut off the coupling from one end, insert the cut off end into the sewer pipe below the obstruction, push the hose in as far as possible and turn on the water. If the blockage is loose material the inrush of water will loosen it and the backrush of water will bring it back down hill. I have tried the plan in very obstinate cases and never yet failed to open the pipes; but you must attack the blockade from the lower end so that the water can undermine it and have a chance to run away. If you attack on the upper end you help to pack the blockade and fill your pipe and excavation with water.

The minimum gradient for self cleansing an 8-inch sewer is about 1 in 400, or 1½ inches in 50 feet, which is 50 per cent. more than is named; for a 6-inch sewer the minimum is about 1 in 300, or 2 inches in 50 feet. Sewers laid on less gradients than these will certainly require regular attention to keep them from stoppage, and those laid on greater gradients will occasionally give trouble from deposits not caused by large objects wedged in the sewer or by tree roots.

THAWING CONDUCTOR PIPES.

BY B. W. G

An unusual provision on a steam heating plant may be interesting to a contracting steam fitter, even though he may not desire to take up with it in his general practice. Just such a piece of work as might come under the above description I was called upon to do to gratify the views of a customer. This customer had a friend who had melted the snow on the pavement in front of his factory by the use of steam through a steam hose leading from the connection on his power boiler. This led him to the conclusion that he could utilize the steam generated in the low pressure steam heating system in his residence for thawing out the ice which formed every winter in his conductor pipe. He insisted that it would be a comparatively small matter to arrange for a similar appliance to be attached to his piping. Upon a little consideration objection to the use of his house heating boiler for this purpose was pointed out, but, as is usual in such cases, even though the arguments were good he seemed to think that a thawing apparatus was the one thing that would make him happy. It may be readily seen that this method of thawing would involve the waste of some of his steam and necessitate replenishing of the boilers with water. To meet these requirements one of Lawler's automatic boiler feeders was connected with the boiler. In running the heating main at points where it was nearest to the rain water conductors tees were placed in the main and provided with nipples and ells, so that the ells faced directly toward the rain water conductors. A globe valve was attached to the ell, and beyond the valve arrangements were made for connecting a steam hose.

Everything, so far as the heating plant is concerned, is ready for the experiment of thawing the rain water conductor, but no report has yet been received that it has ever been used for this purpose. Whether this is due to the failure of the owner to remember the thawing apparatus or from a lack of necessity to make use of it is not known. Any practical man can readily see that, to be efficient, the boiler ought to carry at least 5 pounds of pressure, if it was to be used for thawing. Even if but one conductor was being thawed it can be readily seen that unless the boiler was fired heavily the steam pressure would easily go down and leave the house without a heating medium. To be successful on a cold day when all the radiators were in use the boiler would necessarily have to have a considerable excess power over what is ordinarily provided in a house heating plant to do the extra work of thawing successfully, or it would have to be fired hard. Then to change the incoming water to steam at a pressure to replace the steam used in thawing would probably cause some hitch, especially should several pipes be subjected to the thawing process at the same time. However, my customer has all the appliances ready for use whenever he may wish to use them. He has also been fully informed of all that is likely to happen in case it is used.

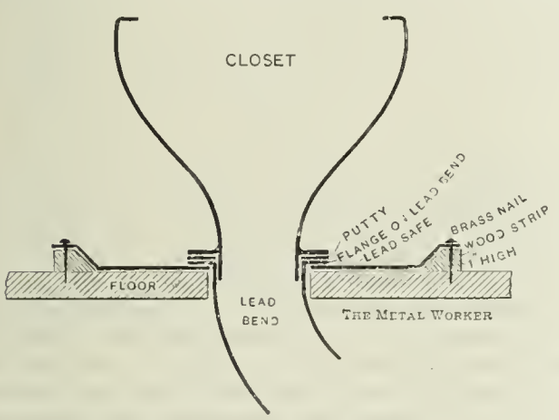
The American Radiator Company have declared the regular quarterly dividend of 1¾ per cent. on their preferred stock, payable February 15.

LEAD SAFES FOR WATER CLOSETS.

BY J. N. S.

The common practice of setting a water closet on the bare wooden floor with putty, whether it be of the wash-out kind or syphon jet, should be condemned, for the reason that the putty saturates the floor with grease and people think that there is a leak under the closet. They see the grease and think that it is water. If there cannot be a lead safe placed under the closet to catch a leak from the coupler or from any other source, there should at least be a piece of sheet lead set on the floor a little larger than the closet. Then the upper end of the lead closet bend or soil pipe should be turned over on the sheet lead. The closet can then be set with putty and screwed firmly down so as to squeeze out all the surplus putty. The sheet lead should then be cut neatly around the bottom of the closet. This will prevent the putty from soaking into the wood and obviate the grease stain.

But I am firmly of the opinion that there should be a lead safe under every closet that has not a water proof floor under it. I have known water closets to overflow, even when set on a marble slab, and the dirty water come



Lead Safes for Water Closets.

down through the ceiling, staining it permanently. A lead safe is not an unsightly thing if it is put in properly. With neat beveled strips about 1 inch high, 2 feet square or whatever the space allowed for that purpose, the sheet lead can be dressed down all around, so that it will fit it neatly and snugly, and then be tacked down with brass headed nails. This safe will prevent the floor from getting saturated with urine, and should there be an overflow, it can be wiped up and not go down through the ceiling, destroying its appearance.

Central Heating Plant at Owatonna, Minn.

A central heating plant is in successful operation at Owatonna, Minn., in connection with the works of the Owatonna Electric Light & Heating Company, using exhaust steam from engines and flue gases to heat water, supplemented by live steam when necessary. Two 15 horse-power pumps force the water through 4 and 6 inch pipes and ½-inch house services, laid in wooden casing filled with mineral wool. When the temperature of the air is 40 degrees the water is forced through the pipes at a temperature of 140 degrees under 10 pounds pressure; when the temperature drops to 20 degrees below zero the water is heated to 200 degrees and forced through the pipes at 40 pounds pressure. At a low temperature it is estimated that a 100 horse-power boiler will furnish heat for 15,000 square feet of radiating surface, but in moderate weather it will supply 25,000 square feet. The loss of heat in the water in the circuit is 20 to 25 degrees. Two miles of mains were added during the past season, this more than doubling the length since the plant was established a little more than a year ago. The amount of radiating surface in use has quadrupled.

The decision of the Michigan State Supreme Court in the case of the United States Heater Company of Detroit against members of the Detroit branch of the Iron Molders' Union of North America, sustains the constitutionality of the act of 1897, which permits the suing of unincorporated associations, "composed of five members or more, having some distinguishing name." The attorneys for the union contended that the act was unconstitutional, because it was aimed particularly at the labor organizations. The Supreme Court does not sustain this contention.

A DISAPPOINTED SALESMAN.

BY SYMPATHY.

Sometimes when the employer is quibbling over the expense account or finding fault with salesmen, he does not take into consideration some of the serious disappointments which the salesmen receive after expending their best efforts. Even the salesmen themselves will confess that there are times that a little "bracing" is not altogether amiss. A short time since a Western salesman accompanied a local customer to the office of an architect, to lend his assistance in determining what was necessary for heating a building, and to endeavor to get his goods specified. While there a wealthy cattle grower dropped in to consult the architect in reference to a large summer residence for which the architect had completed the plans. The cattle grower became interested in the conversation on heating and invited the architect to bring out the plans of his building, so that the embryo engineer could give some assistance and suggestions as to the proper means of heating it. The young man knew that here was an opportunity, and worked "overtime" without any expectation of "union pay" to secure this order.

He so thoroughly imbued the cattle grower with the idea that he must have a heating system in his house and that the apparatus which the young man had for sale was the only one that could be adopted for the work that the owner told the architect to consider the heating matter in the contract closed and to award it to the local heating contractor when he had received the estimate and agreement as to what work would be done. He further said if the young man and the heating contractor would call at his house in the evening he would sign the contract himself, so that the goods could be shipped without delay and the whole matter closed. The salesman was delighted and, after helping the local contractor to make the estimate and draw up a proper contract, went to his hotel for supper and wrote to his house that he had not only settled with the architect about the heating of one plant in mind, but also had sold another complete plant, and had only to go and see the customer to have the contract signed after supper.

In the evening, with the heating contractor, he repaired to the residence of the cattle grower. With true Western hospitality the host met them at the door, but with the discouraging remark that he was sorry that he had spoiled their evening, as his wife had refused to consider the heating apparatus in question. Instead of taking this rebuff as final the salesman asked if he might have the opportunity of explaining the merit of his system to the good lady. The cattle grower replied it would afford him pleasure, and he was shown into the family circle, and the owner's wife listened to the best lecture on heating which the salesman had ever given in his life. Having admitted all the claims that he made as a result, the salesman asked the lady if it would not now be a good time to sign the contract. She replied that there was one question that she desired to ask, and if that could be satisfactorily answered there would be no objection to signing the contract. She stated that the new residence was to be used only as a summer residence and that she never expected to be in that house with any of the family at a time of year when fire would be needed to furnish a comfortable temperature. Under these circumstances she desired to know why on earth it was worth while to think of putting in any kind of a heating system? In face of such a question there was only one thing for the salesman to do, and that was to write to his house before he went to bed that the deal with the cattle grower was off.

How to Use the U-Gauge.

The Denver (Col.) Gas & Electric Company have issued to their employees the following instructions for using the U-gauge to assist in locating causes of complaints:

Employees in the gas department must familiarize themselves with the U-gauge, which can be made of great value in locating causes of complaints arising in the use of gas appliances, and especially fuel appliances. Congestion in the service pipe, meter or meter connections is often the source of unsatisfactory results, and may cause excessive bills. Every gas appliance has some favored rate of gas consumption at which it will do the most economical work, and generally the most satisfactory work. A stoppage in the pipe may reduce the flow to a rate much below this.

In measuring pressures for obstructions we are most interested in the drop in pressure between two points, and not in the absolute pressure. To locate the point of congestion in the supply pipe, the gauge should be attached at the furthest point from the source of supply, the street main, and enough gas used at some point remote from the source of supply to cause a considerable fall in pressure; then, by successively attaching the gauge at points nearer and nearer the source of supply, the congestion may be located, providing all the congestion is at one point. The point of congestion will be readily noticeable by reading the pressures on the U-gauge. If the fall in pressure is considerable but uniform from point to point, it merely indicates that the quantity of gas flowing is greater than the capacity of the pipe, but if a particular drop in pressure occurs between two points, it clearly indicates that the congestion exists between these two points.

This drop in pressure must necessarily be influenced by the quantity of gas demanded or in use. Assuming that you have, say, 20-tenths pressure in the main, you will have at this altitude in the house exactly the same pressure, provided no gas is being used, even though there is a passageway only as big as a pinhole at the congested point. If gas is being used the pressure is dependent upon the quantity flowing, hence to determine whether serious congestion exists in the pipes the pressure must first be measured, at some convenient point in the pipe, with every burner on the premises turned off, and must again be measured at a point remote from the street main with the maximum quantity of gas flowing, and which is, therefore, demanded. If an excessive drop in pressure occurs the pipe is either obstructed or too small for the quantity of gas flowing.

The drop in pressure will be as the square of the gas flowing. As an example: Say you had flowing 20 feet of gas per hour, and the drop in pressure was 2-10 inch; then to find the drop in pressure for any other quantity of gas you would multiply 20×20, and the ratio of this product to the square of any other rate of flow would represent the ratio between the two drops in pressure. We have, for instance, in one case $20 \times 20 = 400$, which we have found corresponds to a drop of 2-10 inch; now, should we want to determine the drop with 40 feet of gas flowing we would multiply $40 \times 40 = 1600$. As 1600 is four times as much as 400, the drop in pressure would necesarily be four times as great, or 8-10 inch.

Serious fluctuations in pressure will be apt to alter the time required for any appliance to do a given amount of work. It may even reduce the flow of gas to a point where the appliance will not do the work for which it was intended. Generally speaking, the best results in fuel gas appliances for cooking or heating, using a Bunsen burner, are obtained with the maximum pressure of gas, provided the supply is not checked by any valve or stopcock, but is checked entirely by the size of the gas orifice in the burner. This is due to the fact that the Bunsen burner operates on the principle of induction, and the inductive effect is greatest when the velocity of the gas issuing from the orifice is greatest. If all of the pressure contained in the gas is distributed in the Bunsen burner it tends to produce a more intimate mixture of gas and air, and the more intimate this mixture becomes the more intense will be the combustion and the higher the flame temperature.

Fiske & Co., Natick, Mass., inform us that they have been busily engaged in heating and plumbing the barn of J. B. March, at Wells Hills, and plumbing the new Congregational Church at Wellesley Hills. They have also done the heating and plumbing in new houses for Miss Morgan and A. R. Clapp. The firm are remodelling the plumbing in the house of N. Swift and putting a new Richmond Boiler in the French Church at Cochituate.

THE EFFECT OF AIR IN WATER SERVICE PIPES.

BY P. P.

There are many men working at the plumbing trade who have never studied natural philosophy or much of anything else, and it is not strange that they will arrange piping so that it will become air bound. To men of this class such an invisible and unsubstantial material as air, which can be pushed aside with a fan, is not taken into consideration in the arrangement of their work. Two instances have recently been brought to my attention where water would not flow, to the utter astonishment of the men who did the work of arranging the piping. One of these pieces of work was done by a man in



The Effect of Air in Water Service Pipes.—Fig. 1.—Water Stopped Flowing at Right Hand Basin.

the progressive and highly enlightened city of New York, and on the island which is New York itself, not in the suburbs that have been added as satellites. In one of the high tenement houses there was a wash basin at the top floor which was supplied with water from a tank on the roof; consequently there was very little pressure. A wash basin was desired in an adjoining room, and as it would have made considerable trouble to run the pipe across under the floor to the desired fixture, a supply pipe for it was carried up to the ceiling, then over to the lavatory, as shown in Fig. 1, and dropped down and connected with the basin cock, as indicated. To my mind it was the most natural thing in the world for air

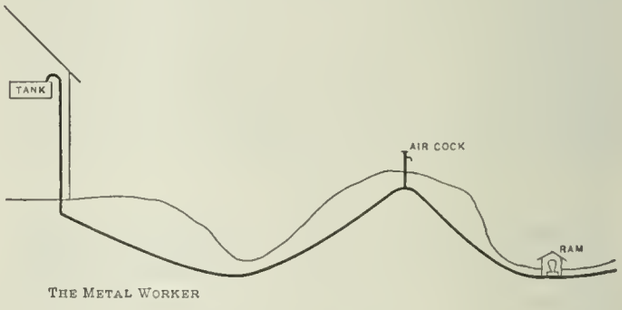


Fig. 2.—Air Lock in Ram Pipe.

to collect in the horizontal pipe running along the ceiling, and it finally did. There being such a small pressure exerted to overcome the air lock at that point, owing to the small distance of the tank above the pipe, it was not long before it was impossible to draw water at the new wash basin. This lavatory was rendered useless until it was suggested that an air valve be placed in the horizontal pipe to allow the air to escape; after that no further trouble was found with the lavatory.

The other trouble from air was in the pipe from a hydraulic ram to the tank in a country house. Between the house and the ram there was a space of low ground, and between this low place and the ram was a low hill. It was found that after the ram had operated for about 24 hours it was impossible to drive any more water through the service pipe to the tank. Immediately inquiry was made from men who might know the cause to find out what stopped the flow of water. In order to prevent freezing the pipe from the ram followed the line of the surface of the ground, but about 3 feet below it. This formed an air trap at the little hill. On the advice

of a man who had considerable experience with ram work a small hydrant was located on top of the hill, as shown in Fig. 2. so that when air accumulated it could be allowed to escape. This overcame the difficulty.

The amount of pressure that is required to dislodge air or to force water past air trapped in a pipe increases very fast in proportion to the depth of the air lock. If a service pipe is in the ground, or suspended from joists, so as to sag and form several air locks, little pressure will be required to force water to pass the first lock. About twice as much will be needed to make it pass the second, and the pressure that will be required to pass the other air locks will continually increase and be very much in excess of this. All who run water service piping should be instructed by their employers, or the foreman under whom they work, of the effect of an air lock in a service pipe, and should be instructed to arrange their piping so that it will never have any traps in it.

Modern Factory Heating Systems.

A good example of the heating methods employed in a modern shop may be observed at the new repair shops of the Rhode Island Suburban Railway Company on Cranston street, Providence, R. I., says the *Journal* of that city. These shops cover about 3 acres of ground and are heated by what is known as the indirect hot blast system. Near the rear of the building is located a vertical tubular boiler, and the steam is conveyed through asbestos covered piping to a heating chamber on the second floor in the center of the shops. In this chamber the steam passes through a series of cast iron radiators of large heating surface. The cold air is drawn over these radiators by two large exhaust fans and warmed. After passing through the fans the air is forced through galvanized iron piping to the various divisions of the shops. The piping varies in diameter from 5 feet near the central heating chamber to 6 inches at the various outlets, which are mostly located on the inside of the outer walls of the building about 7 feet above the floor level. At each outlet is a hand damper to control the admission of hot air into the shops. There are several of these outlets, averaging about 12 feet apart, so that the warm air may be distributed very freely through the rooms, and the large number of outlets does away with cold spots.

The fan apparatus is in duplicate, so that either one or both fans may be run, depending on the atmospheric temperature, or either fan may supply the entire system. The fans are operated by two specially constructed motors so that they may run at two different speeds, thus making at least four variations in the amount of hot air that may be supplied.

The galvanized ducts are in and under the roof trusses of the building, entirely out of the way of the shop work, and are so gauged in size that the velocity of the delivery of the air at any outlet is substantially the same. The condensed steam or return drip goes back to the boiler automatically.

In some of the ducts there are baffle plates, or deflectors, which make it possible to keep some at a higher temperature than others.

During the recent cold snap, which is the first real trial the system has had, the heating plant kept the shops at a suitable temperature. It is believed that this system is superior to the system which diffuses the air to the various rooms through a few very large openings.

The entire system is installed in a first-class manner, and these 3 acres of building, averaging about 25 feet in hight, are heated at the present time at an expenditure of about 2 tons of coal per day.

This system was designed and erected by Westinghouse, Church, Kerr & Co. of New York, under the direction of the engineering department of the Rhode Island Suburban Railway Company.

A. Morris Collins, for many years a buyer for the E. W. Blatchford & Co., Chicago, died at his home on January 26 as the result of an attack of appendicitis.

ASSOCIATION NEWS.

Canadian Master Plumbers.

The second annual banquet of the Master Plumbers' Association of Hamilton, Ont., was held in the Waldorf Hotel January 29. Andrew Rogers presided and W. G. Smith was in the vice-chair. About 35 persons were present. Among those who responded to toasts were: J. Hillwell, J. H. Harr, J. Patterson, R. Somerville, R. Armstrong, J. Mann, H. Ross, H. W. Anthises, Toronto; O. G. Carscallen, Hugh S. Wallace, Ald. W. Findlay, Hamilton.

Manhattan Delegates.

At a meeting of the Manhattan Branch of Master Plumbers' Association of New York City, held on February 4, the following delegates were elected to attend the annual convention of the New York State Association of Master Plumbers, to be held at Elmira in March: A. H. Brown, B. F. Donohue, Philip Brady, T. A. Hill, A. W. Reynolds, T. J. McCormack, Wm. Kirchoff, T. J. Tuomey, E. J. Brady, T. J. Cummins, M. J. O'Brien, Alex. Bryant, S. L. Malcolm, John Renehan, I. O. Shumway, Thos. F. Gaynor, I. J. Brown, W. J. McDermott, J. A. Rossman, J. T. Coyle, John Boyd, Frank Reynolds, I. J. Barth, J. W. Cooney, T. S. Cochrane, Jr.; T. F. McCaul, M. F. Donahue, C. A. Walsh, H. G. Gabay, Chas. Tucker, J. F. Kelly, A. E. Jackson, Sam. Klein, John Mitchell, Geo. McQuillan, J. W. O'Brien, E. J. Renehan, J. D. McEntee, L. H. Stroh, John Yule, Paul Euell, H. E. J. Schiffer, Milton Schnaier, Thos. Martin, Jos. Corkery, P. J. Andrews.

A Buffalo Plumbers' Dinner.

A delightful banquet was given by W. A. Case & Son of Buffalo, N. Y., to the Master Plumbers' Club on the evening of January 30, covers being laid for 70. Mr. Case was absent because of illness, but he was represented by his partner, Mr. Fell, who acted as toastmaster. The toasts were as follows: President Steuart of the local association, "Master Plumbers;" Mr. Huck, president of the State Association, "The State Association;" Arthur E. Stevenson, "Fire Hydrants;" Charles Geiger, "The Future President of the State Association;" Samuel Bart, "City Hall;" John Kavany, "The Directors of Buffalo;" John J. Stygall, Jr., "Executive Committee;" Fred. J. Vaux sang and Donald Lund and Joseph Ayex told stories. There was a recitation by Mr. Mitchell.

Banquet in the Plumbing Trade.

The Manhattan Branch of the Master Plumbers' Association of New York City have arranged to give a testimonial banquet to the Honorable Percz M. Stewart, Superintendent of Buildings, at Shanley's, Broadway and Forty-third street, on Wednesday evening, February 19, and the following committee has been appointed to take charge of the affair; A. W. Reynolds, chairman; T. F. Gaynor, treasurer; Alexander Bryant, William Bryan, T. J. Tuomey, I. J. Brown and W. J. McDermott. This banquet is tendered in a friendly spirit, in view of the favorable action which the Superintendent has taken in considering several important matters which have emanated from the association, and it was ordered by a special resolution of the association. The committee have been ordered to provide an affair suitable to the occasion, and commensurate with the dignity and reputation of the association. The committee having the affair in charge have issued invitations to the members, expressing a hope that they will find it convenient to be present and thus add to the general felicity of the occasion. They request that those who intend participating will express their determination at an early date, in order that proper provision may be made.

L. E. Ballou has sold out his plumbing business in Beechertown, Mass., and will open up a shop in Barre.

The P. and S. S. League.

The closing games of the Plumbing and Steam Supply League bowling tournament are being contested. On Monday night the good fortune which has attended the John Simmons Company team found but three men on the team of the salesmen, their sharpest competitors, and they had practically a walkover for their first game, while the team of the Central Foundry Company made a very poor showing for the second game. The Diamond S. team has now completed its schedule, having won 12 and lost two games, and cannot be beaten for the first place, although they may be tied by the teams of Behrer & Co. and the Crane Company. The feature of the Thursday night bowling was the winning of another game by the E. F. Keating team, so that they force the Thomas G. Knight team to share the honors of being tailenders with them, and they may have still more company. They also beat their previous high score and placed it at 675, when they beat the Central Foundry Company team. But they were subsequently beaten by the Dimoch & Fink Company team, which afterward lost to the Central Foundry Company, making honors even for the evening.

It is probable that the tournament will close with a dinner, when some of the most prominent men in the trade will respond to the call of the toastmaster and present the prizes to the winners. This movement to bring the trade together in social entertainment has been very popular. Those interested in the league have encouraged the formation of the Business Men's Championship Tournament, in which teams from the following leagues will be represented: Bank Clerks', Life Insurance, Fire Insurance, Drug Clerks, Commercial and Plumbing and Steam Supply. R. C. Wilson has been elected president, M. C. Hoyt, secretary, and H. Cadien, treasurer. This tournament will open March 3 and close May 4. The teams will consist of ten men, five to roll in the first game, five in the second and a selected five in the third game on the same evening. H. Cadien has presented a $60 trophy, which must be won twice in succession to become the property of any team. In addition, there will be three team and two individual prizes. The match with the bowlers in the Boston supply trade has not yet been arranged.

New York City Notes.

Trade is reported as very quiet in all the boroughs, ordinary winter jobbing and repairs being particularly dull. What new work and overhauling is in hand is principally that which has been going on for some time.

* * *

L. D. Hosford will have a nice job of plumbing to do in the First Scientist Church, at the corner of Central Park West and Ninety-sixth street. Chas. Hensle is getting well on with the block he is doing for John V. Signall, between Ninetieth and Ninety-first streets.

* * *

The city plumbers have been changed. Since February 1 Wm. Montgomery has the City Hall Park buildings, in the place of J. F. Sweeney. Wm. H. Montgomery has the ontside buildings, except the armories, in the place of Jno. W. O'Brien. Ambrose Neal has the steam fitting.

Charles F. Hauss, who has spent the past two years in Europe introducing American heating apparatus to the foreign steam and hot water fitters, has connected himself with the American Radiator Company of Chicago. Mr. Hauss will make his headquarters at Antwerp, Belgium. He sailed for that city on the Red Star Line steamer "Kensington" on Thursday, and will devote himself this year to advancing abroad the interests of the extensive line of Radiators and Steam and Hot Water Heaters made by the American Radiator Company. The success that has attended Mr. Hauss' previous trips abroad should be surpassed with the more extensive line that he now has to offer the heating trade, with the assistance of the company's branch in London and their other foreign connections.

Heating and Plumbing Notes.

A bill has been introduced into the New York Legislature to amend the plumbing laws by the addition of the following paragraph: "A person duly licensed as an employer or master plumber in any city of the State may follow and conduct such trade, business or calling in any other city of the State, except the city of New York, upon filing certified copy of his license in the office of the Board of Health in the city in which he desires to carry on and conduct such trade, business or calling."

J. A. Smith of Akron, Ohio, has brought suit against all plumbers in that city who belong to the Master Plumbers' Association, on the ground that they constitute a trust. The suit is for heavy damages.

Capt. Henry Goss, for many years prominent as a plumber and a citizen of Kansas City, Mo., died at the home of his daughter, Mrs. Howard McCutcheon, in Kansas City, on January 26. Captain Goss served the country in the Civil War, where he secured his military title. In 1874 he settled in Kansas City and entered the plumbing and heating business. He was well known to association plumbers throughout the United States. Captain Goss is survived by two daughters.

E. H. Good, clerk of the Board of Education of Tiffin, Ohio, will receive bids until February 21 for the new heating system for the Columbian High School. Bids for heating the building with hot water and steam will be considered.

Harry L. Hemenway, for many years a member of the plumbing firm of the F. O. Ray Company, Nashua, N. H., has withdrawn from the company and accepted a position in Milford.

A fire recently occurred at the plumbing establishment of J. W. Hill, Lancaster, Ohio, doing damage to the extent of more than $1000, which was partially covered by insurance.

Rourke Brothers of New Haven, Conn., have moved into new quarters in the Kelly Building, at 834 and 836 Grand avenue. This building is 50 x 100 feet and it is lighted on three sides. The front is occupied by general and private offices, and the shop space is divided so that one-half is devoted to cornice and sheet metal work and the other half to plumbing and heating. The shops are equipped with modern machinery operated by electricity. In addition to the shop and offices, the firm have the entire basement of the building, giving them ample facilities for carrying a stock of Pipe and Steam Fitting and Plumbing Goods. They are displaying a line of Model Boilers and a variety of designs for Metal Ceilings and Side Walls, a branch of business to which they are giving special attention. They are now engaged in plumbing and steam heating the new Young Men's Christian Association Building, and are plumbing the new Greist residence, in New Haven. They are also doing the plumbing and sheet metal work on a new warehouse for Dillon & Douglass, as well as the sheet metal work on the new City Mission building.

The Adams & Jones Company of Boston, Mass., issue, under date of February 1, an announcement that Irving G. Dimond has associated himself with that house, and will represent them in the States of Maine, New Hampshire and Vermont, with headquarters at Portland. In addition to the Ideal Boilers, the company will have to offer to the trade this year a complete line of Radiators and a full line of Steam and Hot Water Specialties.

Harry Park has sold out his plumbing business, at 509 North Main street, Findlay, Ohio.

The John T. Bealor Mfg. Company, formerly of Erie and West Diamond streets, Allegheny, Pa., are sending out a notice of the removal of their plant to the four-story building, 1300-1342 River avenue, formerly occupied by the Standard Mfg. Company, where they will have more room and better facilities to carry on

their business of steam, hot water and hot air furnace heating, and making sheet metal work, cornices, skylights and ventilators. The notice states that the company have a complete drafting and estimating department, and would be pleased to place it at the disposal of architects, builders and owners. They make a specialty of the Superior Warm Air Furnaces and the Heating Apparatus made by the Utica Heating Company.

Thomas Roberts, 15-17 Main street, Toms River, N. J., informs us that he has the contract to drive three 3-inch wells for the water company at Island Heights, N. J., and to tap the mains and run the pipes to the service boxes at the curb.

The Examining Board of Plumbers of Albany, N. Y., organized on January 27 by the election of Robert I. Wilson as president and City Clerk A. J. Hoogkamp as clerk. The rules and regulations governing the proceedings of the board, and the rules and regulations for the examination of persons applying for a certificate of competency, and the rules and regulations governing plumbing and drainage, now in force, were declared to be the rules of the present board.

W. H. Morrison, Torrington, Conn., has the contract for plumbing two blocks of buildings that are being erected in that town by Hotchkiss Brothers.

The main building of the Seestedt Brothers Mfg. Company of Romulus, Mich., manufacturers of Bathtubs, Closet Seats, &c., was destroyed by fire on January 29.

The contract for a plumbing, gas fitting and hot water system and a ventilating system for the new County House at Butte, Mont., has been awarded to J. Kreuger at his bid of $4922.

Simpson Clark, Springfield, Mass., is installing Hot Air Furnaces in the residences of Mrs. Jovey, Charles Clark, C. N. Dean and William Patton in that city. He is putting Steam Boilers in the residences of George Austin and W. A. Hatch and is also busy with some plumbing contracts.

Miles D. Lindley, president of the Board of Education of Hamilton, Ohio, will receive bids until February 21 for heating and ventilating a new school building in that city.

The master plumbers of Memphis, Tenn., have promulgated a new set of shop rules, which has led to a strike in that city. It is claimed that the new rules in many instances are a direct contravention of the rules of the local unions.

For the purpose of learning the views of the steam and hot water fitters of New Jersey on the subject of a local association, a meeting was held last week, when it was decided to issue a call for a meeting in Newark this week. At the time we go to press this meeting is being held for the purpose of forming a local association, to be affiliated with the National Association of Master Steam and Hot Water Fitters, and for the election of officers. T. B. Cryer of T. B. Cryer & Co., Newark, N. J., is prominently connected with the movement.

S. E. Dibble, New Haven, Conn., is remodeling the plumbing in the residence of Frederick Ives. The contract includes new bathrooms, lavatories, water closets and hot and cold water service. A gasoline pump and engine will also be installed to insure a positive water supply.

Joseph J. Spencer of the firm of Spencer & Parks, manufacturers of Gas and Electric Light Fixtures, died suddenly on February 3 from cerebral hemorrhage, at his place of business, 194 Park avenue, New York.

Wept Brothers, Findlay, Ohio, manufacturers and wholesalers of Plumbers' Water, Gas and Oil Well Supplies, have purchased the property formerly occupied by McManus & Seymour, manufacturers of rakes, which they will convert into a machine shop. The firm will enlarge the plant by the erection of a store room and offices and in connection with the machine department will carry a complete line of Mill, Engineers' and Plumbers' Supplies.

The stockholders of the Pittsburgh Valve, Foundry & Construction Company at their annual meeting January 27 re-elected the old Board of Directors, consisting of President Henry M. Atwood; J. T. Speer, vice-president; Moses Atwood, secretary; Charles A. Anderson, treasurer, and R. J. Wilson. No financial statement was made public, but it was stated that the company had done splendidly during the year. No new improvements are contemplated, as the company completed their new foundry and machine shop on Twenty-sixth street some time ago. The offices will be moved to the works.

The Stover Mfg. Company, Freeport, Ill., held their annual meeting on January 27 and elected the following list of officers: D. C. Stover, president; A. S. Held, vice-president; W. A. Merrifield, general manager, secretary and treasurer; O. J. Ziegler, general superintendent; W. A. Hance, superintendent of machinery; J. M. Irwin, superintendent of agencies. The year 1902 opens auspiciously for the company, the demand being greater than ever for their line of Windmills, Grinding Mills, &c. The new factory which has been building during the past year is now ready to occupy, and the transfer of the stock and machinery will be made the first week in February. When settled in the new quarters the company will have the best possible facilities for the manufacture of Windmills and Grinding Mills, and at least three times greater capacity than in the past.

The Kellogg-Mackay-Cameron Company, wholesale dealers in Heating Supplies, covering the entire Western country, have closed arrangements for the Clow Building at Lake and Franklin streets, Chicago, and will occupy it about March 1. The firm's business has outgrown the present quarters at 110 Lake street, and they will utilize the ample space in the seven-story building above mentioned, where everything required in the steam and water heating business will be carried in stock, including Boilers, Radiators, Pipe, Fittings, Brass Goods, &c.

The McKenna Brothers Brass Company, Limited, of Pittsburgh, manufacturers of Brass Goods and Saloon Supplies, have decided to give 10 per cent. of the net profits of the concern to employees remaining on the pay roll at the end of the year. The division is to be made on the basis of wages earned by each. If the plan proves successful it will be continued. The men affected are, as a rule, skilled workmen and their salaries range from $18 to $25 per week. The net profits to be divided among the men will come from the manufacturing part of the plant. The McKenna Brothers Brass Company, Limited, are now occupying their new building, First avenue and Ross street, Pittsburgh, which gives the concern very much larger facilities for carrying on their business.

The new plant of the Charlotte Pipe & Foundry Company, Charlotte, N. C., went into operation last week. It is a complete modern foundry plant. The main building is 100 x 150 feet in size, and equipped to produce 2, 4 and 6 inch pipe in 5-foot sections, using pig iron from the Birmingham district. The incorporators of the company are W. F. Dowd, S. F. King, Z. V. Kendrick, J. P. Beggs and J. J. Beggs. The last two named are experienced manufacturers, formerly located at Birmingham, Ala.

The Robert Leinau Heating Company of Philadelphia have secured the contract for the steam heating plant for the next Camp Curtin Building, at Harrisburg, Pa.

United States Consul-General Guenther of Frankfort, Germany, says that the Central Museum established by the Society for the Improvement of Workmen's Dwellings in that city desire catalogues and price-lists and samples, if possible, of American building material, including Sheet Iron Work, Plumbers' Supplies, Sashes, Doors, &c. Communications should be addressed to Dr. Phil. Stein, 1 Boersenstrasse, Frankfort, secretary of the society.

New Firms and Changes.

J. M. & H. Hamaker have opened a shop at Middletown, Pa., to do a plumbing and general sheet metal business.

The plumbing firm of Reed & Conant, Gardiner, Maine, have been dissolved.

The Hartford Blower Company, 65 Suffield street, Hartford, Conn., are a new concern recently organized

with a capital of $50,000. The officers are Elizur Keeney, president, and C. H. Keeney, treasurer and general manager. They will manufacture Steam, Electric and Pulley Fans, Exhaust Systems and Mechanical Draft Apparatus. The company are the sole manufacturers of the Hartford Patent Adjustable, Interchangeable and Reversible Blowers and Exhausters. They will make a specialty of all the apparatus required for forced and exhaust draft, steam heating, ventilating and drying apparatus, dust separators, blast gates, galvanized sheet iron piping and heavy sheet iron work. The company are prepared to install complete systems for exhausting the refuse from wood working factories, sawing and planing mills, foundries, polishing and buffing rooms, pulp and paper and textile mills, sugar and dye houses, shoe factories and fertilizer works. They are about to issue a new catalogue which will be of interest to those who require such apparatus or systems.

Miles Kehoe has qualified as a master plumber by passing the examination of the city of Oswego, N. Y., and will open up for business at 164 West First street.

The Peter Schaefer Plumbing Company of St. Louis, Mo., have been incorporated with a paid in capital of $5000, of which Henry E. Calvert has 27 shares, Peter Schaefer 20 shares, Floyd B. Calvert 2 shares and Joseph Fox 1 share.

The Stephen Lane Company have been incorporated with a capital of $10,000 at Atlantic City, N. J., to engage in the plumbing business.

The Rundle Mfg. Company have succeeded the Sanitary Enameling Company of Milwaukee, Wis. At a meeting of the Board of Directors on January 22 R. G. Hayssen was elected president; A. H. Hayssen, vice-president, and Charles L. Rundle, secretary and treasurer. The firm will make Enameled Bathtubs and a full line of Sinks, Lavatories and Water Closets.

The Kirby-Williams Company of 216 South Main street, Pittsburgh, Pa., have been organized to deal in Merchant Pipe, and to do a pipe cutting, threading and bending business, also to sell second-hand machinery. The company are at present in the market for pipe cutting and threading machinery.

The Ellison Brown Electric Heater Company of Philadelphia have been incorporated with a capital stock of $250,000, to construct apparatus for the generation and development of heat by electricity.

The Duty on Nickel Plated Tin Plates.

Washington, D. C., February 4, 1902.—The Treasury Department has promulgated an interesting decision with regard to the dutiable classification of tin plates plated with nickel on one side, in which is discussed the entire question of the proper classification of plates treated in any other manner than by the ordinary process of tinning. The facts in the case upon which the ruling is made, together with the Department's decision, are set forth in the following communication from Acting Secretary Spaulding to the Collector of Customs at New York:

The merchandise in question consists of tin plates 21 inches wide, 30 inches long and 0.023 inch thick, plated with nickel on one side and commercially designated as "nickel plated tin plates."

In Treasury decision 6844, dated April 7, 1885, the Department decided that certain "lacquered tin plates" consisting of the ordinary tin plates of commerce, coated with a thin varnish or lacquer to imitate brass, used in the manufacture of tin cans, boxes, signs, &c., were dutiable as "tin plates" under paragraph 153 of the tariff act of 1883, of which paragraph 134 of the existing tariff act is a substantial re-enactment. And in the unpublished decision of the Board of United States General Appraisers, dated October 29, 1900, in the matter of the protest of the American Trading Company, it was held that certain "gold lacquered crystallized tin plates," were classifiable under the provision for tin plates in paragraph 134, and not under paragraph 193 of the tariff act of July 24, 1897. The Board remarked, citing Treasury decision 6844, supra, that——

"The fact that these tin plates have been covered with a coating of lacquer does not alter their classification, for they still remain tin plates, but their designation as lacquered tin plates is solely to distinguish them from the plain and ordinary tin plates."

Paragraph 134 provides for sheets or plates of iron or steel, commercially known as tin plates, "coated with tin or lead, or with a mixture of which these metals, or either of them, is a component part." . . . It therefore might be objected that tin plates, coated or plated with nickel, are not specifically provided for in that paragraph, but the article in question would nevertheless fall within its terms by virtue of the similitude clause in section 7 of said act.

In view of the foregoing and as tin plates are expressly excepted from the provisions of paragraph 132, imposing an additional duty of two-tenths of 1 cent per pound on iron or steel sheets or plates "when galvanized or coated with zinc, spelter, or other metals, or any alloy of those metals," . . . the Department concurs with the views expressed by you that the merchandise here under consideration is dutiable at 1½ cents per pound, under said paragraph 134 of the existing tariff act. It should be added that the assessment of a lower rate of duty on articles not specially provided for in the present law, manufactured wholly or partly from tin plate other than that imposed on the tin plate of which they are made, is prohibited by the terms of paragraph 140 of said act.

THE SHEET MEETING AT PITTSBURGH.

Pursuant to a call issued by A. F. Baumgarten of the Maryland Sheet Steel Company, at Cumberland, Md., about 15 independent sheet manufacturers met in the Hotel Lincoln, Pittsburgh, on Monday, February 3. The purpose of the meeting, as stated in the letter sent out to the trade by Mr. Baumgarten, was for the purpose of affording opportunity for the independent sheet manufacturers to become better acquainted, to take up the matter of prices of sheets, and also the question of supply of sheet bars and prices of same. W. L. Glessner of the Laughlin Nail Company, operating a sheet mill at Martin's Ferry, Ohio, was chairman of the meeting. A full discussion of existing conditions in the sheet trade was had by those present, but no action of importance was taken. At present the demand for sheets regulates prices, which are quite profitable to the manufacturers in spite of the high prices of sheet bars. The question of a number of the leading independent sheet mills going together to build an open hearth steel plant to roll sheet bars was discussed informally, but no definite action was taken. Some of the sheet mills are pretty well covered on sheet bars for this year and do not see the necessity now of building a steel plant. A. F. Baumgartner was appointed corresponding secretary for the purpose of addressing another letter to the independent sheet manufacturers, with a view of having a fuller meeting, to be held in Pittsburgh in the latter part of this month.

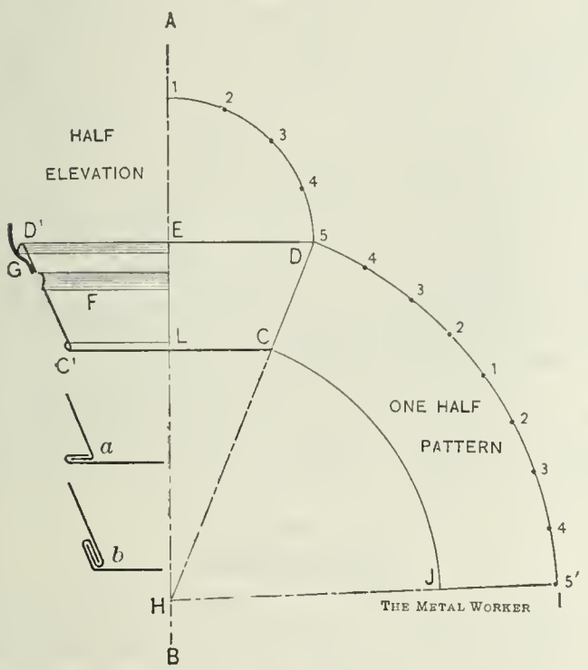
The N. & G. Taylor Company

The N. & G. Taylor Company announce the removal of their general offices from the Branch street building, which they have occupied since 1845, to the Mariner and Merchant Building, Chestnut and Third streets, Philadelphia, where they have had spacious offices handsomely fitted up for their use. This change was rendered necessary by their rapidly growing business in the line of tin plates and iron and steel sheets, and also their trade in open hearth soft steel sheets for stamping purposes, which are made at their works at Cumberland, Md. The company's minor offices have been transferred to their tin plate works at Tasker and Swanson streets, Philadelphia, where the company have also erected large warehouses for the storage of goods. The company's tin plate department has also been enlarged, and a new smelting works erected to meet the increased demand for their solder, babbitt metal, &c.

PATTERN FOR ROUND DISH PAN WITHOUT ALLOWANCE FOR LAPS.

In the accompanying illustration is shown the method of obtaining the pattern for a round dish pan, which can be made in two or more pieces of I C or I X tin with grooved seams. First draw any line, as A B, upon which place the hight of the pan, as E L. From E and L at right angles to A B draw the lines E D and L C to their required dimensions, and draw the line D C, which extend as shown, until it meets the center line at H. Then with H as center and radii equal to H C and H D, draw the arcs C J and D I respectively. Now, with E as center and E D as radius describe the quarter circle D 1, which divide into equal spaces, as shown by the small figures 1 to 5. Set the dividers equal to one of these spaces, and starting at D step off twice the amount of spaces contained in the quarter circle E 1 5, as shown by the small figures 5 to 1 to 5′ on the arc D I. From 5′ draw line to the center H, intersecting the inner curve J C at J. Then will C D J I be the one-half pattern for the dish pan.

The bottom to the pan is double seamed. The first operation is shown by *a*, the second and final operation



Round Dish Pan.

by *b*. D¹ E L C¹ shows a half elevation of the finished pan. Using the small beader, a bead is placed as at F. Tinned iron handles are riveted in position, as at G, and a wired edge is made at the top.

Australian Tin and Tin Mining.

BY JOHN PLUMMER, SYDNEY, AUSTRALIA.

The deposits are scattered widely throughout Australia, there being over 120 recognized stanniferous localities in New South Wales alone; but comparatively few are worked to any considerable extent, limited water supply and absence of cheap and speedy means of communication with the coast forming at present—apart from fluctuations in market prices—the leading difficulties encountered. Although in the parent State the existence of tin was discovered as far back as 1851, it was not until over 20 years later that mining operations were commenced. In 1872, according to Professor David of Sydney University, tin stone was accidentally discovered while searching for gem stones near Inverell, in the northern part of the State. Mixed with a number of sapphires and other gems in the gravels of the creeks was a heavy black mineral, in water worn grains, which, on assay, proved to be oxide of tin. The discovery becoming known, a Sydney company took up some ground in the vicinity, and then commenced a rush to what are now known as the New England tin fields.

Strangely enough, the stream tin, as the black material is called, had long been familiar, under the name of "black sand," to alluvial gold miners in the district, where its weight, rendering it difficult of removal from the sluice boxes, had caused it to be regarded as worse than a nuisance. In some places the stockmen, ignorant of the real character of the sand, used it for cleaning their bits. Native tin has been found in the State, but, as in other parts of the world, it is of rare occurrence. The same may be said of stannite, or tin pyrites, although it is plentiful, with galena, zinc blende and arsenical pyrites, in the Borah Creek Silver Lode, near Inverell.

The common ore of tin is the oxide, otherwise known as cassiterite or tin stone, found in New South Wales in several forms, and of various colors. At Vegetable Creek, the leading tin field in the State, between 1872 and 1885, 15,000 tons of cassiterite are said to have been extracted from a shallow alluvial deposit, within a distance of a little over 5 miles from its source downward. The total area of ground worked was about 150 acres, which produced 15,000 tons of stream tin, or at the average rate of 100 tons per acre, or half a hundredweight of cassiterite per cubic yard, allowing the mean depth of the wash dirt to be 2 feet 6 inches. The depth of stripping (overlying soil) varied from 6 inches to 9 feet. At Catarrh Creek about 1000 tons of stream tin were obtained from the shallow alluvials within a distance of about 1 mile. The width of the deposit varied from 200 to 450 feet, and the depth of sinking to the granite bed rock was from 10 to 14 feet. The Vegetable Creek workings are situated in what, during early Tertiary times, formed the main drainage channel of this part of the State. In portions of its course there were two distinct flows of lava, an older and a newer, each covering a bed of stanniferous wash dirt. Up to 1886 the produce of these latter was 6000 tons of stream tin in a distance of 2 1-3 miles. At one place an area of 5½ acres of gravel, having an average thickness of 3 feet, yielded 2000 tons of tin ore.

In the far western portion of the State, at Euriowie and Poolamacca, about 50 miles to the north of Broken Hill, tin ore occurs under conditions differing materially from those of the other New South Wales tin fields, the ore bearing a marked resemblance to that from the Harney Peak mines of South Dakota, in the United States, and to such an extent that specimens from the two places cannot be readily distinguished from each other. A considerable area of ground was pegged out for mining purposes when these deposits were first discovered, but probably not more than 100 tons of dressed ore were dispatched from the field before it was abandoned. The scarcity of water for the necessary concentration processes, and the distance (several hundred miles) which separates the district, which is rich in minerals, from the seaboard, are the chief reasons which led to the cessation of mining operations, which are certain to be resumed when conditions are more favorable.

It is, however, as pointed out by E. F. Pittman, in his work on "The Mineral Resources of New South Wales," in the northern portion of the State that the principal stanniferous deposits occur. From near Tamworth tin bearing rocks extend northward, with some intermission, up to the Queensland border. The mean width of this area is about 30 miles, and within it are the leading New South Wales tin fields. The largest export of tin raised in the State was 9125 tons, value £824,552, in 1883; and the greatest value £833,461 (for 8670 tons), in the previous year. The quantity exported in 1900 was 916 tons 7 cwt., value £120,932, making the total quantity exported since the opening of the New South Wales tin fields, in 1872, 135,078 tons, value £10,849,238. This does not include the produce of other States.

STEELE, ANDRE & Co. are a new firm, at 113 South Main street, West Hartford, Conn., recently organized for conducting a tin, copper and sheet iron business, together with furnace heating. The new firm are composed of Wilbur S. Steele and L. R. Andre, who are both well known to the trades, having been for many years connected with George M. Couch. They have secured the agency for the well-known Thatcher Furnaces.

Parkersburg Iron & Steel Company.

Permanent organization of the Parkersburg Iron & Steel Company, incorporated some time since for the manufacture of sheets, was effected last week at Parkersburg, W. Va., when the following officers were elected: President, H. H. Nieman, formerly president of the Canonsburg Iron & Steel Company of Canonsburg, Pa.; vice-president, H. S. Duncan, formerly a member of the Canonsburg Iron & Steel Company; secretary and general manager, J. F. Budke, a State Senator of Pennsylvania and former manager of the Canonsburg Iron & Steel Company; treasurer, L. A. Meyran, formerly secretary and treasurer of the Canonsburg Company, and assistant secretary, A. H. Geilfuss, formerly assistant secretary of the company named. The following, in addition to the above named officers, were elected on the Board of Directors: A. E. Succop, A. E. Nieman, F. W. Budke, W. R. Geilfuss, George W. Flowers, Charles H. Geilfuss and W. H. Paxton.

The company's plant, which is already in partial operation, is located at Parkersburg, W. Va. Four mills were recently started and two additional mills are now being erected. The combined capacity of the six mills will be 70 tons of sheets daily. The company's plant embraces a main mill building, 120 x 486 feet. This building contains sufficient space for the installation of six additional mills, which it is proposed to add to the plant during the present year. An additional building, 110 x 225 feet, will be erected adjoining the mill building for a skelp and bar mill, and a forge department to make hammered iron blooms for the production of sheet iron will also be installed, together with a tin dipping plant. The entire plant is expected to be in operation within two months. At present the office of the company is located at the Times Building in Pittsburgh. As reported recently in these columns, the company have bought the stamping plant of the Budke Mfg. Company of Canonsburg, Pa., and will remove the same to Parkersburg, placing it on a site adjoining their rolling mills. A number of additions and improvements will be made to the stamping plant, including an equipment of the most modern improved machinery.

To Increase Production of Heavy Sheets.

The general superintendents of the American Sheet Steel Company are making a tour of inspection of the various mills of the concern. It is reported that the company will this year invest about $1,000,000 in the extension of their plants, and the present inspection by the superintendents is said to have a connection with these plans. According to a report from Pittsburgh, all the important plants of the American Sheet Steel Company are to be enlarged during the coming spring, more especially in the direction of equipment for rolling heavier gauge sheets. The capacity of the company's plants for the production of the lighter gauges of sheets is said to be amply sufficient for some time to come, but the demand for heavier sheets is increasing so rapidly that the company are obliged to take steps to provide enlarged facilities in this branch of their business. It is said that the great sheet plant at Vandergrift, Pa., will be added to during the present year, as well as the Apollo Works, and also some of the Indiana plants. The outlay of about $1,000.000 will be used mainly for machinery and equipment.

The Rolling Mill Company of America.

Work on the new ten-mill plant of the Rolling Mill Company of America, at South Connellsville, Pa., will be pushed to completion as rapidly as possible. Ground for the plant has already been broken and contracts have been let for the buildings and machinery. The plant will include four principal buildings, with a combined floor space of 66,500 square feet. The main building will be 108 x 410 feet; the finishing building, 50 x 300 feet; packing, shipping and warehouse building, 30 x 150 feet, and boiler house, 40 x 80 feet. All these buildings will be of steel and brick. All of the machinery, except the rolls, will be operated by electricity. The rolls will be driven by two 36 x 60 inch Hamilton-Corliss engines, each capable of developing 1600 horse-power. The fly wheels of the engines will be 30 feet in diameter, and will weigh 82 tons each. It is said that these will be about the largest fly wheels in use in this country. The plant throughout will be equipped with the most modern and improved machinery, and is designed to be a model establishment of its kind. George J. Humbert, who is well known as the head of the Humbert Tin Plate Company and the founder of the town of South Connellsville, is at the head of the new company. Mr. Humbert resigned the position of district manager of the American Tin Plate Company some time since.

Ornamental Sheet Metal Work.

We have received from L. H. Solosth & Sons, Grand Rapids, Mich., successors to the Ornamental Stamping Works of that city, a copy of their large catalogue of ornamental sheet metal work. It is composed of 110 pages, 10 x 12 inches in size, inclosed in a dark blue cover with gilt embellishment. The catalogue is bountifully illustrated by some 1300 line engravings and halftone cuts showing a very large variety of ornamental sheet metal work of all kinds used for architectural purposes. The first half of the catalogue is occupied by a variety of examples of artistic work in zinc and copper, embracing some very handsome and intricate designs suitable for all kinds of interior and exterior ornamentation. These are followed by examples of sheet metal statuary in zinc, bronze or copper. Finials, balusters, urns, steel siding, imitation pressed brick, weather vanes and metal letters and figures follow. The last pages of the work are devoted to a handsome line of steel ceilings, side walls, moldings, center pieces, coves and cornices, together with rosettes, and other architectural objects. Note is made that the company also manufacture a patent chimney cap and a line of copper and brass ware and nonrusting tinware. They also make machinery and dies for stamping purposes, and are prepared to do all kinds of metal spinning, stamping and pressed work. The office and factory of the company are located at 127 West Wealthy avenue, on the Lake Shore Railroad, Grand Rapids, Mich.

FLASHINGS.

President Shaffer of the Amalgamated Association is credited with the statement that at the annual convention of the association, to be held in Wheeling, W. Va., in April, a movement will be inaugurated looking to the abolition of the present mill committees, salaried district presidents being elected, whose duty it will be to settle all disputes within their districts.

The Provident Slate Company, Slatington, Pa., are sending out a circular letter to the trade, calling attention to their unfading Washington-Bangor and other grades of Roofing Slates. The company state that they are at present operating four quarries, each producing monthly 3000 squares of the best unfading Slate. The Washington-Bangor grade of Slate, they state, is mined from a depth of 325 feet, and its color is strictly unfading. Inclosed with the circular letter is a price-list, f.o.b. quarries, of the various grades of Roofing Slates which the company sell. The prices given apply only to shipments made prior to April 1, at which time another advance, they say, will probably take effect. The concern also carry a full line of Slaters' Tools.

The Dowman Mfg. Company of Atlanta, Ga., manufacturers of the Dixie Ventilator and of Galvanized Iron and Copper Cornices, Skylights and Finials, inform us that they have been awarded the contract for the sheet metal work on "Squash Court," which William C. Whitney is erecting at Aiken, S. C.

The Asphalt Ready Roofing Company, 136 Water street, New York, are sending to the roofing trade a calendar for 1902, the leading feature of which is a picture of a building showing the application of their Roofing Materials.

James Ackroyd, 10 and 12 James street, Albany, N.

Y., announces that he has associated with himself in business as contractors for roofing and architectural sheet metal work his sons, Hildreth J. Ackroyd and Austin W. Ackroyd, under the firm name of James Ackroyd & Sons.

We are indebted to the Slatington-Bangor Slate Syndicate, Slatington, Pa., of which James L. Foote is the general manager, for one of the large hanging calendars for the year 1902 that they are distributing among their customers and friends. The calendar sheets are 20 x 26 inches in size, and are bound in brass at the top, the monthly dates having figures of a size that can be readily seen at a considerable distance. In a little circular which accompanies the calendar the company apologize for the late date at which it is issued, remarking that there are, however, advantages is distributing a calendar to arrive alone on or after February 1 which do not attend the sending of it on January 1, when it would be merely considered with a number of others that arrive about the same date.

H. Clay Lynn, 409 Brook avenue, Richmond, Va., informs us that the outlook in the Cornice and Skylight department of his business is particularly bright. He has secured contracts for a number of buildings now in course of erection and to be erected, among which are the Bell Telephone Building in Richmond, three large stores at Hampton, Va., two stores at Newport News, Va., and a number of private residences in his locality.

George W. Jaques, who for upward of 35 years has been connected with the old established firm of A. A. Thomson & Co. of New York City, which went out of existence on January 1, has established himself at 234 Pearl street, New York, as a Tin Plate and Metal broker. Mr. Jaques' long connection with and experience in the Metal trade renders him peculiarly qualified for the line of business which he has taken up. He is very well and favorably known to the trade in the Eastern part of the country, and has the best wishes of many friends for success in the new line that he has adopted.

Samuel Cabot, 70 Kilby street, Boston, Mass., is the manufacturer of Cabot's Insulating and Deafening Quilt for use in buildings. It consists of a filling of cured eel grass, which will neither burn nor decay. The long, flat fibers cross each other at every angle and form a soft, resilient cushion of innumerable minute dead air spaces, the fiber being held in position by two sheets of paper closely stitched or quilted. The Quilt is designed particularly for the insulation of heat in connection with dwellings, cold storage pipes and ducts, poultry houses, under tin, &c., and in the absorption and dissipation of sound waves as a deafening agent especially for school houses, hotels, hospitals, society lodges, gymnasiums, residences, &c.

The Jackson Iron & Tin Plate Company, who are building a plant at Clarksburg, W. Va., advise us that their buildings are well under construction. About 90 per cent. of their machinery is on the ground, part of it being set, and they expect to be in operation in about 30 days. The officers of this concern are: T. M. Jackson, president; W. J. Grove, secretary and treasurer, and C. C. Moore, general manager.

George G. McMurtry, president of the American Sheet Steel Company, has been elected a director of the Rock Island Railroad.

A. Beard, manager of the Midland Works of the American Sheet Steel Company, Muncie, Ind., has been appointed division superintendent, the Piqua Works of same company, at Piqua, Ohio, having been placed under his charge.

John Stephens, superintendent of the Midland Works of the American Sheet Steel Company, Muncie, Ind., has resigned his position and will be connected with the Inland Steel Company, which concern will build Sheet mills at Indiana Harbor, Ind.

The Midland Works of the American Sheet Steel Company, at Muncie, Ind., have been much improved during the past six months, and other improvements are under way. A new tinning house is being erected and the plant is being equipped with special machinery for the manufacture of high grade Sheets. The plant is now operated almost entirely on specialties.

The Crescent Works of the American Tin Plate Company, at Cleveland, will undergo extensive improvements. A new annealing and cold rolling department will be added and the annealing furnaces now in use will be replaced by a single large furnace and the capacity of the finishing department will be largely increased. Work will be started on the improvements during the coming week, and while it is under way the annealing and cold rolling departments of the works will be idle.

The Wheeling Roofing & Cornice Company of Wheeling, W. Va., are erecting a new plant at New Martinsville, in that State, for the manufacture of Corrugated Sheets, Ceilings and Conductor Pipe, Eave Trough, Ridge Roll, &c., also a tinning plant of six sets and a galvanizing department. This plant will be operated by the company in addition to their works in Wheeling.

The Tucker Mfg. Company of Newark, Ohio, have been incorporated with a capital stock of $50,000 to operate a sheet plant.

A report from Wheeling, W. Va., states that M. F. Tighe of that city, now assistant secretary of the Amalgamated Association of Iron, Steel and Tin Workers, and a well-known labor leader, will be a candidate for president of the Amalgamated Association, in opposition to Theodore Shaffer, at the annual convention to be held in Wheeling in April. A year ago Mr. Tighe was mentioned as a possible candidate for the office, but because of the fact that the strike was pending his friends decided that it was best for him not to run.

The Cadwallader Tin Plate & Metal Company of Pittsburgh, Pa., recently incorporated with a capital stock of 150,000 by George A. Cadwallader and associates, will operate a tinning plant at Hazelwood, Pa. The company are at present engaged as Tin Plate and Metal jobbers in Hazelwood. A building 50 feet square will be erected, in which will be installed three tinning sets, and an office building will be put up. The company will, for the present, purchase their supply of Black Plates, but it is possible that they may later decide upon erecting a plant for the production of Black Plate.

The Youngstown Iron, Sheet & Tube Company, Youngstown, Ohio, have ordered S. V. Huber & Co., Pittsburgh, to draw the plans for their new open hearth steel plant, to be erected on a site between Haselton and Struthers, Ohio.

Grant C. Nobbs has opened a sheet metal working establishment at 2520 and 2522 Smallman street, Pittsburgh, Pa., where he proposes to manufacture Steel Stacks, Forges, Exhaust Pipes, Tanks, &c.

It is reported that the American Can Company's factory, at Havre de Grace, Md., will soon be removed to Baltimore, and consolidated with their Norton plant in that city.

Follansbee Brothers Company, Pittsburgh, Pa., are distributing a price-list of Stove Pipe Material, Wood's Refined Smooth Sheets, Wellsville Polished Steel Sheets, American Blue Steel Sheets and Wood's Patent Planished Iron, of which goods they are carrying large stocks, and are prepared to ship to any part of the country on receipt of orders.

A new steel roofing establishment will be opened shortly at Milwaukee, Wis., to be named the Milwaukee Corrugating Company. It will be under the direction of Louis J. Kuehn, who for a number of years has been manager of the La Crosse Steel Roofing & Corrugating Company, La Crosse, Wis. The company last named will continue in business as heretofore, being now exclusively owned by John C. and G. F. Kroner, who have purchased Mr. Kuehn's interest. It is expected that the new venture to be made by the latter will rapidly secure an important position in the steel roofing trade, as Mr. Kuehn established a high reputation by his success in building up the business at La Crosse. He is the inventor of the Kuehn Rain Water Cut Off, which has proved a very popular device for this purpose.

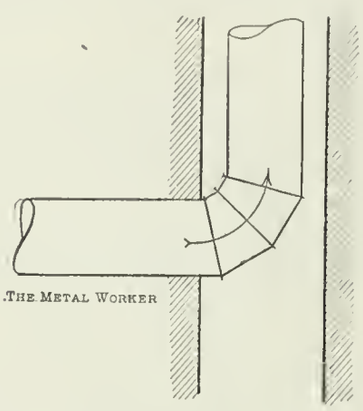
THE LETTER BOX.

Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

POOR DRAFT IN STONE CHIMNEY.

From A. J. W., Philadelphia.—I have never heard of a chimney that would not draw if it was piped properly, and "F. H. W.," whose inquiry appeared in *The Metal Worker* of January 18, must have the joints in the pipe in the flue tight. He must have the boiler smoke pipe continue on into the flue and connected to the upright pipe with an elbow, as shown in the sketch herewith. The connection should be continuous from the smoke collar on the boiler to the top of the chimney. The pipe should have an ordinary cap on the top. If the fire will not burn, there must be some defect in the



Poor Draft in Stone Chimney.

boiler, but the draft can be tested by disconnecting the pipe from the smoke collar and burning a dozen old newspapers in the flue.

From Hoarse Sents, Red Wing, Minn.—The trouble with the chimney of "F. H. W.," as described in *The Metal Worker* of January 18, is that in starting the fire the cold air in the chimney is too heavy for the force of the boiler blast to push up and out. The smoke can get out more easily by escaping into the cellar. For a remedy I would suggest that he have an opening made into the chimney flue in the cellar, for convenience, provided with a cap or lid to stop it. Every time the boiler is fired, just before starting the fire, this cap should be taken off and some light material, such as shavings or newspapers, that will burn quickly, should be put into the flue to start up the heat and cause an up current in the flue. Smoke from the boiler will be drawn in by the ascending current in the chimney and will keep the chimney warm and drawing. It "does it" for our church chimney. Try it! Better take the stove pipe out of the flue, for it is not needed, as the draft will be easier managed without it.

ZINC FOR MILK VESSELS.

From F. W. K., Mason City, Ind.—I would be glad to have *The Metal Worker*, or some of the readers who have had experience, give me some information as to the advisability of using zinc in a vessel for milk. I put a bottom in a tank 11 x 3 x 1½ feet; the sides were to be of XXXX tin, and as it was impossible to get the tin in large enough sheets in time I used the next best thing available, which was zinc. Now, what I want to know is will the milk have any action upon the zinc, and would it be dangerous if the milk was to stand in this tank not more than four hours before going through a separator?

Answer.—While zinc is not the proper metal to use for vessels to store milk or milk products in, there can be no harm to the milk if the tank is made perfectly clean by a hot soda wash and a thorough wiping every time it is used. The standing of fresh milk in the tank for four hours will not affect the milk to a discoverable degree if perfect cleanliness is observed. The zinc will not be absorbed by sweet milk to a greater degree than by water, and the extensive use of the zinc lined ice water tanks shows them to be considered free from danger. Sour milk or curdled milk, however, should not be allowed in such tanks. It is the acid condition that absorbs the zinc to an objectionable extent.

COST OF FLANGES AND VENTILATOR.

From J. R. C., Camden, N. J.—I had hoped that some one would answer in last week's paper the inquiry of "R. & B.," in *The Metal Worker* of January 25, but as they have not I will give a method of arriving at the selling price for such sheet iron work that was pursued in the shop where I worked for a number of years. If a man insisted on having a price in advance we estimated amply for the time that it would take to do the work, and told him that it would cost him, at that time, 50 cents an hour. We told him that the material would cost a given price per pound and would include all the waste, as well as the material used. This was also estimated amply. If I was going to make such work now I would lay out the patterns on the material and then weigh the material before cutting, charging for all of the material, even if a considerable part of it might afterward be used for other purposes. The price per pound on material should be determined by every man according to its cost. The charge for the time is more easily reached; for the cost of material is something that many men never absolutely know. They fail to include in the cost of the work they produce their taxes, interest, rent, the cost of keeping a horse, insurance, light and the wages of the laborer, the clerk and the bookkeeper, where one is kept. If "R. & B." have not found out what this expense amounts to every year in their business, and also the amount of business done in some previous year, so that they can divide the expense and find out how many cents on every dollar should be charged in addition to the absolute cost of materials, they would be very safe in adding 20 per cent. to the cost on their bills for material before they added a percentage for profit. When we made galvanized iron elbows in our shop we used to charge double the weight of material used, and the time of making, when a special elbow was needed for some particular purpose. This may not be the information which "R. & B." desire, but it may be of some assistance to them.

WHY DID THE VALVES FREEZE?

From F. L. W., Traer, Iowa.—Will *The Metal Worker* or some of its readers give us a remedy for the following trouble? We have a church here heated by steam from a boiler in the basement. The church is not kept warm all of the time. It frequently goes without heat from Sunday until Thursday. Under these circumstances the temperature often falls below the freezing point in the auditorium, and when that happens the bonnets of the radiator valves burst from the freezing of the water contained in them. This would easily be accounted for if the valves were closed so that there might be some water left in the radiators; but the valves are always left open when steam is allowed to go down, so that any water in the radiators may drain out and run to the boiler in the basement. The trouble is caused by the steam pressure forcing the water up through the threads of the stem into the bonnet of the valve, where it is held by the pressure and fails to drain out when pressure is allowed to go down.

IS IT POOR DRAFT?

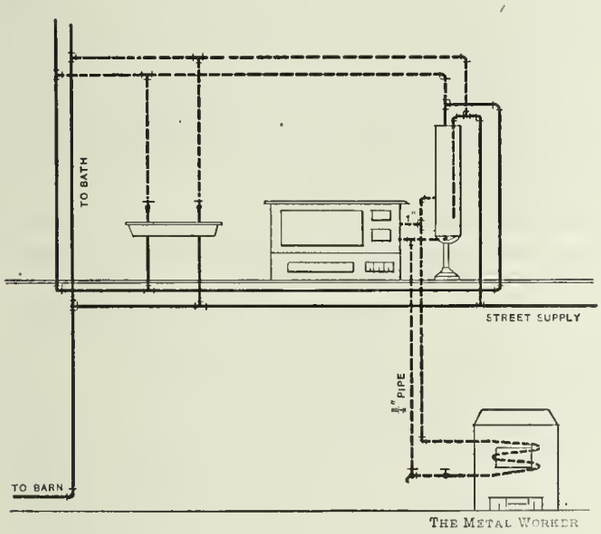
From B. R., Portland, Pa.—Will *The Metal Worker* or some of its readers tell me what is the trouble with a furnace in which the gas will not burn off, but explodes and blows open the feed door, particularly when fresh coal is added and the feed door is shut and the draft door is open? The chimney has a good draft, but, nevertheless, the trouble I describe is found.

EXHAUSTIVE QUESTIONS ON HEATING.

From F. J. G., Wyoming.—Noticing in *The Metal Worker* of January 18 the request of "C. C. C." for information regarding the calculations for all kinds of heating, I would call attention to an article which has been of interest to me. In *The Metal Worker* of March 2, 1895, there appeared a paper by James Mackay, which treated in brief on many points of the subject, and the notes which I took of the paper at that time have been of considerable value to me. Perhaps if this paper, or portions of it, was reprinted, even at this late date, it would be of value to "C. C. C.," as well as acceptable to others.

COLD WATER FROM BOTH FAUCETS.

From C. P. A., Port Ewen, N. Y.—In looking over *The Metal Worker* of January 11 I notice the diagram of piping recommended to "I. D. H.," but as it does not agree with my views I thought I would see if something that provided a better plan of circulation could be devised. Would it not be better to connect the stove and the heater to the boiler separately, so that when the stove only was being used the water would not have to circulate through the heater, or if the heater only was in use it would not have to overcome the cooling effect of the cold water back in the stove? I should also favor running the pipes along the kitchen ceiling instead of dropping them down to the cellar. The sketch herewith shows my plan of connecting the piping with the boiler. As this is a problem often met with in these days, I hope that those who have had experience will give sketches of their successful jobs.



Cold Water from Both Faucets.

PROTECT TANK PIPE FROM FREEZING.

From S. & S., Warren, Pa.—We have a customer who has a water tank supported on a steel tower some 80 feet above the ground. This tank is supplied by means of a 2-inch iron pipe, and we would like to know the best method to follow to prevent this pipe from freezing in severe weather when it is filled with water.

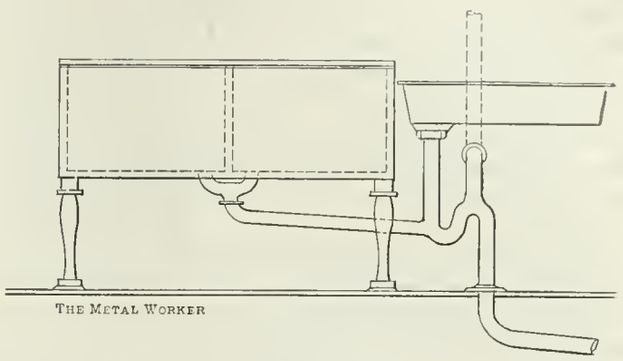
Note.—We shall be glad if our readers will give their views on this question. In the meantime we would suggest that the pipe should be heavily insulated. If the water can be kept flowing in the pipe it is much less likely to freeze than if it is allowed to stand still. If some provision can be made for a slight leakage at the bottom this would aid in preventing freezing.

MACHINE FOR PAINTING TIN.

From J. Callaghan & Son, Cleveland, Ohio.—We desire to secure a machine to paint tin in rolls and would be pleased to hear from those who make such a machine.

A QUESTION IN WASH TRAY TRAPPING.

From M. B., Tarrytown, N. Y.—We should like to have the readers of *The Metal Worker* who are experts in sanitary work express their views as to which of the two methods of connecting the waste pipe of wash trays and a sink, where they are set together, is the best. In our opinion the method shown in Fig. 1 is the best, because



A Question in Wash Tray Trapping.—Fig. 1.—The Method of Trapping Proposed.

the sink being used almost constantly the trap is always sealed. Wash trays, in a number of houses, are not used at all, and in many kitchens seldom more than once a week, or once every two weeks, so that there is a chance for the trap seal to evaporate or be broken by oscillation. If the connections are made as shown in Fig. 2 there is a chance for the trap under the tubs to lose its seal.

Note.—We hope our readers will not allow this question to go undiscussed. In the mean time we would observe that the plumbing regulations of many cities would not allow the piping arrangement shown in Fig. 1. It would be pointed out that foul water would lie in the wash tray waste pipe and might be the cause of bad odors. It would also make it necessary to set the sink trap lower than is considered good practice, and owing to the fact that a larger surface of the waste pipe is exposed on the house side of the trap, evidence of the decay of any waste matter that might stick to the sides would naturally find its way through the sink strainer into the kitchen. These are the considerations which would probably govern the plumbing inspector, and which would be provided against in a modern set of plumbing regulations. In either case the fixtures are effectually protected against the entrance of sewer air by the seal of the trap.

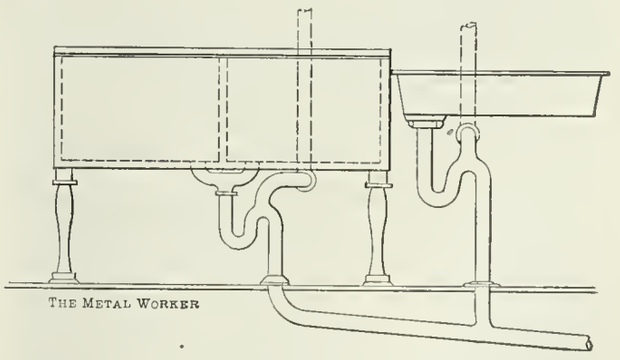


Fig. 2.—Trapped According to Regulations.

LIQUID STOVE POLISH.

From L. P. K., Cockeysville, Md.—I shall be glad to have some reader of *The Metal Worker* present his receipt for making stove polish in liquid form.

The development of the petroleum fields of Kentucky has been greatly stimulated by a number of recent rich strikes of illuminating and lubricating oils, and it is believed that the production of Kentucky oil will in time become an important industry.

TRADE REPORT.

MARKET SUMMARY.

Pig Tin is quiet and ½c. higher.

Copper rules slightly lower, with little doing.

Pig Lead is dull and firm.

Spelter is weak and very quiet.

Antimony is unchanged.

Nickel is without change.

Aluminum shows no change and is in active demand.

Tin Plates are quiet, with moderate demand at former prices.

Sheets continue in heavy demand; prices are firm.

Sheet Copper was advanced 2c. a lb.

Scrap Iron is active and strong.

Scrap Brass and Copper rule higher.

Pig Iron is scarce, with large demand, and prices very strong.

Hardware is moving in good volume, with prices well maintained.

Plumbers' Brass Goods are irregular in price, owing to advance in Copper. Eastern manufacturers have withdrawn quotations.

Copper and Brass Wire is higher.

Soldering Coppers are up 2c. a lb.

Wire Cloth and Poultry Netting are very strong, with probability of higher prices.

Tinware, Galvanized Ware, &c., are firm and active.

Wire Nails have been advanced 5c. per keg.

Cut Nails were reduced 10c. per keg.

Plain Wire and Staples have been marked up 5c. per 100 lbs.

METAL MARKET.

New York, February 7, 1902.

Pig Tin.—A rather quiet and uninteresting market prevailed throughout the week. The speculative element was almost absent. On Monday prices advanced for Spot Tin, but they eased off the following day, and subsequently reacted in an upward direction, ruling at the close about ½c. per lb. higher than the figures given in our last report. Jobbers quote Straits Pig in small lots at 25c. to 25½c. per lb. The consumptive demand during the week, as for some time past, was very light.

Copper.—The first speculative boom of the year in this metal reached its hight and collapsed during the past week. Wholesale prices were steadily raised until 13½c. was reached for Lake Copper on Monday, but at the close of that day a break occurred, followed by a general easing off. At the close of the week the market showed signs of returning strength, and it was the general impression that the bottom had been reached for the present. The market, however, is in such a peculiar condition that it is impossible to foreshadow its future course, which is not unlikely to be as full of surprises as it has been in the past few weeks. Under the circumstances, the consumptive demand is light, current buying being almost entirely confined to comparatively small lots. Jobbers are still quoting Lake Ingot in small lots at about 13½c. to 14c. per lb., and Casting Copper at 13¼c. to 13¾c. It is conceded that the recent advance has been broken. The movement was ill timed, for consumers bought a three months' supply at bottom figures. The exports of Copper for the month of January were very heavy. Two-thirds of the metal shipped went to England.

Sheet Copper.—As intimated in last week's report, the manufacturers of Sheet Copper have advanced the price of that material, following the upward movement of Raw Copper. Announcement was made on February 3 of an advance of 2c. in the base price of Sheet Copper, bringing it to 18c. per lb., the price at which it ruled prior to the last reduction in the latter part of January. A large amount of business has been booked by the manufacturers in the past two weeks, and even since the latest advance consumers have continued to show an interest in the market, orders coming in freely. Manufacturers, however, while booking contracts for prompt delivery at the current rates, will not guarantee against a further advance. At the same time it is generally regarded in the trade as improbable that prices of Sheet Copper will reach a higher level in the early future. From the condition of the market for Ingot Copper it looks as though high tide had been reached and passed.

Pig Lead.—With the exception of higher quotations in London and the extra 2½c. per 100 lbs. imposed on spot purchases here, the market for Pig Lead was unchanged. There has been but little demand and prices have ruled firm at the figures of the American Smelting & Refining Company. Jobbers quote American Pig in small lots at 4.40c. to 4½c. per lb. St. Louis advices indicate an improved tendency in the volume of business in Pig Lead in that market, with prices holding very firm around the present level.

Spelter.—The market for Spelter is very weak here, and also dull, there being but a light demand for the metal. Good Western brands in small lots are quoted by jobbers at 4½c. to 4⅝c. per lb. St. Louis advices report a slightly heavier volume of business during the past week in the Spelter market there, prices being without change.

Sheet Zinc.—There is a fair demand for Sheet Zinc, which is quoted by jobbers at 6¾c. per lb. for 600-lb. cask lots and 7¼c. for smaller quantities.

Antimony.—No change is recorded in this market. Hallett's and U. S. in small lots are quoted at 8¼c. to 8¾c. and Cookson's at 10¼c. to 10¾c. per lb.

Nickel.—The market is unchanged, small lots being quoted on the basis of 60c. per lb.

Aluminum.—The demand for Aluminum continues brisk. Prices are without change. Small lots of No. 1 Ingot, guaranteed 99 per cent. pure, are quoted at 37c. per lb. and 100-lb. lots at 35c.

Tin Plates.—The market for Tin Plates remains without change of any kind. Large consumers are still placing orders with the leading interests covering their wants for the first half of the year. But the majority of them are understood to have already satisfied their requirements. A fairly large volume of business is being done in a retail way in this market, but more competition has been developed among jobbers, and prices for small lots are hardly as strong as they were a while ago. A few jobbers are said to have cut prices in order to obtain business, a proceeding which is claimed by others in the trade to be entirely unwarranted under the conditions existing in the market. Deliveries are still very backward, and the supply of Tin Plates barely keeps pace with the current demand. American Bessemer Coke Plates, I C, 14 x 20, in small lots, delivered at New York and corresponding points, rule at about $4.80 to $5.05 per box. An advance of 4½ pence per box was made during the week in the price of Welsh Coke Plates, bringing them up to 12 shillings 10½ pence, Swansea.

Sheets.—A full account of the meeting of the independent Sheet mills, held this week in Pittsburgh, is given elsewhere in this issue. An active demand for both Black and Galvanized Sheets is still noted, and prices among the mills are very firm. However, some of the jobbers who have stocks bought when prices were lower are said to be offering Sheets at lower prices than the mills. Jobbers' quotations here are without change, No. 27, One Pass, Cold Rolled Soft Steel Sheets ruling at about 3.90c. to 4c., and Galvanized Sheets at 67½ and 5 per cent. to 70 per cent. off the list.

Chicago advices are as follows: Sales agents are enjoying a good demand for all classes of Sheets, and the independent mills are now advancing their prices, thus making the market firmer. The mills are in most cases oversold, and it is difficult to secure prompt deliveries. Small lots of No. 27 Black Sheets from store are selling at 3.35c. to 3.45c., Chicago. Galvanized Sheets are selling at 70 and 2½ to 70 and 5, with occasionally a lower price being made.

Old Metals.—The demand for Scrap Iron is very active, and prices in this material are strong. Scrap Brass and Copper are also considerably higher on the strength of the advance in raw Copper. Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper	per lb. 11 c.
Light and Tinned Copper	per lb. 9 c.
Heavy Brass	per lb. 8¾c.
Light Brass	per lb. 6¾c.
Lead	per lb. 3½c.
Tea Lead	per lb. 3½c.
Zinc	per lb. 3 c.
No. 1 Pewter	per lb. 15¾c.
No. 2 Pewter	per lb. 8 c.
Tin Plate Scrap, per gross ton	.... to $5.00
Wrought Iron Scrap, per gross ton	$11.50 to 12.00
Heavy Cast Scrap, per gross ton	11.00 to 11.50
Stove Plate Scrap, per gross ton	10.00 to 10.50
Burnt Iron, per gross ton	6.00 to 7.00

THE PIG IRON MARKET.

New York.—The market is hardening, and it is becoming increasingly difficult to place any orders for delivery during the first half of the current year. One of the leading producers of the Lehigh Valley had advanced prices to $17 for No. 1 and $16.50 for No. 2 Foundry, at furnace, to which 65c. must be added to arrive at the tidewater price. We quote for Northern Irons: No. 1, $17.65 to $18; No. 2 X, $16.75 to $17.25; No. 2 Plain, $16.15 to $16.50; Tennessee and Alabama brands, No. 1 Foundry, $16.25 to $16.75; No. 2 Foundry, $15.75 to $16; No. 1 Soft, $16.25 to $16.75; No. 2 Soft, $15.75 to $16; No. 3 Foundry, $15.25 to $15.50; No. 4 Foundry, $14.75 to 15.

Chicago.—The demand is strong for all kinds of Pig Iron and for all kinds of deliveries. Some large contracts have been placed for Foundry Iron, running through the year. Prices of Foundry Pig could be readily advanced, but sellers are conservative, and are endeavoring to discourage the least indication of "boom" conditions. We quote as follows:

Lake Superior Charcoal	$20.00 to $21.00
Local Coke Foundry, No. 1	16.50 to 17.00
Local Coke Foundry, No. 2	16.00 to 16.50
Local Coke Foundry, No. 3	15.50 to 16.00
Local Scotch, No. 1	16.50 to 17.00
Ohio Strong Softeners, No. 1	19.50 to 20.00
Southern Silvery, according to Silicon.	16.90 to 17.15
Southern Coke, No. 1	16.40 to 16.65
Southern Coke, No. 2	15.65 to 15.90
Southern Coke, No. 3	15.15 to 15.40
Southern Coke, No. 1 Soft	16.40 to 16.65
Southern Coke, No. 2 Soft	15.65 to 15.90

Philadelphia.—Iron is probably scarcer at the present time than it has ever been, and more scarce at the heaviest consuming points than anywhere else. All grades of Iron are in equally light supply; in consequence, prices are irregular and practically unquotable at close figures. With this understanding, it may be said that No. 2 X Foundry ranges from $16.75 to $17.50, the latter figure for February and March delivery guaranteed. The outlook is not encouraging for those who look for lower prices, and the makers of Pig Iron do not appear to have any desire for higher prices, so that the immediate course of the market depends entirely on day to day happenings. Prices, in a general way, would be about as follows for Philadelphia and nearby delivery: No. 1 X Foundry, $18 to $18.50; No. 2 X Foundry, $16.75 to $17.50, and No. 2 Plain, $16 to $16.50.

Pittsburgh.—The market has been quiet in the past week, consumers being pretty well covered, but mainly for the reason that furnaces have little or no Iron to sell. Most of the output of the furnaces up to July is contracted for, and were it not for this fact prices of Pig Iron would be much higher than they are now. We quote No. 2 Foundry at $16.50 to $16.75, and No. 1 at $17 to $17.25, f.o.b. Pittsburgh.

Cincinnati.—There has been quite a satisfactory run of business during the past week. In Foundry Pig Iron the trade has been steady and the volume, while not large, has nevertheless been as much as could have been expected. There is now left but odds and ends for delivery prior to July, and almost all selling is for the last half of the year. The situation is practically unchanged, and were it not for the car shortage on the roads north of the Ohio River the cause for complaint would be nominal. Prices are strong and in the main unchanged. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	.... to $15.25
Southern Coke, No. 2	.... to 14.75
Southern Coke, No. 3	.... to 14.25
Southern Coke, No. 4	.... to 13.75
Southern Coke, No. 1 Soft	.... to 15.25
Southern Coke, No. 2 Soft	.... to 14.75
Southern Coke, Gray Forge	.... to 13.75
Southern Coke, Mottled	.... to 13.75
Ohio Silvery, No. 1	$16.75 to 17.25
Ohio Silvery, No. 2	16.25 to 16.75
Lake Superior Coke, No. 1	17.35 to 17.60
Lake Superior Coke, No. 2	16.85 to 17.35
Lake Superior Coke, No. 3	16.35 to 16.85

St. Louis.—Business in Pig Iron in the past week has been on a very liberal scale and substantial contracts for Iron for delivery as far ahead as November are being placed. Shipments are now being received with a reasonable outlook of promptitude, and it is hoped that the improvement in the car situation will be lasting. We quote as follows for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry	$15.75 to $16.00
Southern, No. 2 Foundry	15.25 to 15.50
Southern, No. 3 Foundry	14.75 to 15.00
Southern, No. 4 Foundry	14.25 to 14.50
No. 1, Soft	15.75 to 16.00
No. 2, Soft	15.25 to 15.50

CHICAGO REPORT.

Scrap Iron and Steel.—Rolling mill stock is quiet, but Cast Scrap is in good demand. We quote dealers' buying prices for carload lots, Chicago delivery, as follows:

	Per net ton.
Country Wrought Scrap	$11.50 to $12.00
Machinery Cast	11.00 to 11.50
Malleable Cast	11.00 to 11.50
Stove Plate (free from burnt)	9.00 to 9.50
Burnt Iron and Grate Bars	6.00 to 7.00
Sheet Iron and Hoops	6.00 to 7.00
Plow Steel	.... to 9.00
Breaking Stock	9.00 to 10.00
No. 2, such as Shovels, Hoes, &c.	.... to 7.00
Old Boilers—whole (Iron)	6.50 to 7.00
Old Boilers (Iron) cut in single Sheets and Rings	10.00 to 11.00
Old Gas Pipes and Boiler Tubes	11.00 to 11.50
Cast Borings	5.00 to 5.50
Turnings	10.00 to 10.50
Horseshoes	12.00 to 12.50

Old Metals.—Conditions are unchanged, the demand being strong with dealers holding for higher prices. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	11 c.
Copper Bottoms	9½c.
Copper Clips	10 c.
Red Brass	11 c.
Yellow Brass	9 c.
Red Brass Borings	9 c.
Yellow Brass Borings	7¼c.
Light Brass	6½c.
Pipe Lead	3.50c.
Tea Lead	3.25c.
Zinc	2¾c.
Tin Foil	18 c.
Pewter, No. 1	16 c.
Pewter, No. 2	14 c.
Aluminum	20 c.

Old Rubber.—Business is dull. Dealers' buying prices are as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	42.50	.....
Rubber Shoes	....	6½c.
Rubber Car Springs	....	5½c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6¾c.
Black Rubber	....	4¼c.
White Rubber	....	8 c.

Rags.—Dealers quote buying prices of good Country Mixed Rags, Chicago delivery, at 75c. to 85c. per 100 lbs. in any quantity.

Anthracite Coal.—The continued cold weather keeps trade in lively condition. Chestnut is becoming scarce. Prices are unchanged, as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis.	5.75	6.00
St. Louis	6.20	6.45
Kansas City, Mo.	8.25	8.50

THE HARDWARE TRADE.

February has opened with very favorable conditions. The volume of business is excellent and appears to be satisfactory to all classes of trade. There is little difficulty in selling goods to either jobbers or retailers, and manufacturers generally are naturally refraining from making concessions in price. This fact, together with the high price of the raw material and the gradually increasing cost of manufacturing, gives the market a firm and confident tone. The break in the price of Copper and its subsequent recovery have had the effect of unsettling prices in this line, and at the present time more uncertainty exists in this part of the market than any other. A marked feature of the present situation is the fact that many leading manufacturers enter on the season's business with practically empty warehouses, not having the usual stocks of goods ready to draw from. This makes it not unlikely that the demand will be such as to cause something of a scarcity in several, perhaps in many, lines before the season is over. This will depend in good measure on the promptness with which manufacturers can obtain raw material, a matter in which they have of late had some trouble. The lack of transportation facilities, owing to the shortage of cars, has had something to do with this. The improved condition of the market in several lines is a noteworthy feature. The trade will await with interest developments in regard to Tinware, Sheet Metal Goods, and also the outcome of the conferences which have been taking place between manufacturers of Axes. The recent advances in Bolts, Nuts and Wire Nails have had a stimulating effect on the market as a whole. In only a few important lines, owing to special influences, is there indication of any weakness in price.

NOTES ON PRICES.

Plumbers' Brass Work.—The see-saw movement of the Copper market during the past ten days has had a peculiar effect upon the manufacturers of Plumbers' Brass Goods, and it may be the cause of more or less trouble within the ranks of the Manufacturers' Association. Two of the leading Eastern jobbing houses are said to have recently placed large orders for their wants in this line at prices which are understood to have been much below the prices named by the association. The orders under other than the present conditions would most likely have been placed with some of the Eastern manufacturers, but in the present instance they were placed with Western Brass Goods makers. The prices at which the orders were placed were based upon 11 cent Copper, whereas the association prices are based upon 13-cent Copper. It is stated that the Western makers have covered their wants in the Copper line at a lower figure than 11 cents. As they were known to have been strong association men in the past their present action is apparently based upon some motive other than sympathy with the jobbing trade. The withdrawal of prices on Brass Goods last week was not universal. Only the Eastern manufacturers canceled quotations, and up to the present time no new prices have been announced. It is said that several of the larger New England manufacturers were of the opinion they would be able to buy Copper at a lower figure than 10 cents per pound, and while waiting for the market to justify their anticipations they suddenly found themselves with a very small stock on hand and a rising market. This would seem to be the reason for the Western manufacturers being able to secure the business.

Copper and Brass Goods.—The advance in Ingot Copper is having a marked effect on the price of Copper Goods. Copper and Brass Wire is higher, and Soldering Irons are also held at advanced prices. Copper Rivets and Burrs are thus far unchanged, there not having been any advance since the recent reduction in the price. It is not unlikely that further changes will occur, and the market is being watched closely by buyers. Many dealers and consumers are anticipating the probability of higher prices and are getting their orders in.

Tacks.—The Tack market continues in an unsatisfactory condition. While there is some understanding between the manufacturers, especially in the West, prices are, as usual, uneven, and there is a good deal of variation in quotations named by different manufacturers.

Wire Cloth and Poultry Netting.—These two articles have settled down to a solid basis. Referring to these goods, a leading Eastern jobbing house say: "It is the opinion of a large number of jobbers that it is a 'good hold' to have made their purchase of these goods, and much higher prices will be obtained before the season ends. We believe it is an equally good purchase for the retail merchants to place their orders with some one who will guarantee delivery at as early a date as possible."

Tinware, Galvanized Ware, &c.—The Metal Ware Selling Company, as reported in our last issue, have just been incorporated under the laws of New Jersey, with an authorized capital of $250,000. The purpose of this organization is to sell Household Tinware, such as Galvanized, Tinned, Japanned, Pieced and Stamped Ware and Sheet Iron Goods, now made by most of the leading manufacturers of this character of merchandise. This company, however, will have no connection with anything pertaining to Enameled Ware. Negotiations are now in progress with various manufacturers, many of the details being in process of settlement. It is proposed to sell through this company the various lines of goods named above in somewhat the same way that Copper and Cordage are marketed. In view of the prospect of the consummation of an agreement between the manufacturers of these lines the market for the goods concerned has a decidedly firm tone.

Sheet Copper.—As reported in another column, the price on Sheet Copper was advanced 2 cents per pound on February 2, making the base price 18 cents, the same as it was previous to January 23, 1902, when a reduction of 2 cents per pound, from 18 to 16 cents, base, was made. The reason for this action is the advance in Ingot Copper.

Wire Nails.—Under date of January 30 the announcement was made that the price of Wire Nails had been advanced to a minimum of $2.05 in carload lots, f.o.b. Pittsburgh. This advance was not entirely unexpected by the trade, as it had been rumored that higher prices might rule after the first of the month. The market is characterized by a strong tone. Owing to the stocks of Wire Nails in the hands of jobbers bought before the last advance, the New York market is likely to show some irregularity until they are disposed of. This is the case at the present time, as some jobbers are adhering to their former figures for small lots from store, of $2.25 to $2.30, while others are quoting $2.30 to $2.35.

Cut Nails.—The price of Cut Nails was reduced by the Eastern manufacturers on the first of the month 10 cents per keg. This action was taken so as to make more of a difference between the prices of Cut and Wire Nails than there has been of late. The advance in the price of Wire Nails presented a favorable occasion for making a change in prices. Small lots of Cut Nails from store, New York, are now quoted at $2.20 per keg.

Wire.—At a meeting of the manufacturers in Chicago last week, prices of Plain Wire were advanced $1 per ton. Fence Staples were also advanced to an equal amount, or 5 cents per 100 pounds. The demand for Wire is large, and the market is reported as being firm, Plain Wire in small lots, New York, is quoted at about 2.25 cents, and Galvanized at 2.60 cents.

The machinery and other stock in trade of the Iron Clad Paint Company, Cleveland, Ohio, have been purchased by the Cleveland Facing Mills Company, which is operated by the J. D. Smith Foundry Supply Company. The outfit will be moved from the old plant of the Iron Clad Paint Company, on Seneca street, to the facing mills plant on Carter street, which will be enlarged to accommodate it.

A Century of Growth.

"The Progress of the United States in Its Material Industries" is the title of a monograph issued by the Treasury Bureau of Statistics which contains a series of statements which show the rapid development during the century of the important factors in the present prosperity of the country. These tables, which occupy a number of closely printed pages, show the development in products of the field, forest, mine and manufactory, the growth in our population, wealth and commerce, the extension of railways, telegraphs and other methods of communication and transportation, and present an interesting and instructive picture of the progress of the United States and its people during the period from 1800 to 1901.

Among the interesting facts presented by these tables are the growth of production, the growth of commerce, the growth of wealth, the growth of money in circulation, the growth of deposits in savings banks and the increased number of depositors in savings and other banks, the decrease in interest on the public debt and many other facts of this character. On the production side, it may be said that the cotton produced has increased from 155,556 bales in 1800 to 9,436,416 bales in 1900; the wool produce, from 35,802,114 pounds in 1840 to 302,502,328 pounds in 1901; wheat, from 151,999,906 bushels in 1866 to 522,229,505 bushels in 1900; corn, from 867,946,295 bushels in 1866 to 2,105,102,516 bushels in 1900; copper, from 650 tons in 1850 to 270,588 tons in 1900; pig iron, from 165,000 tons in 1830 to 15,800,000 tons in 1901; petroleum, from 21,000,000 gallons in 1860 to 2,661,233,568 gallons in 1900; coal, from 3,358,899 tons in 1850 to 267,850,000 tons in 1891, and gold, from $50,000,000 in 1850 to $79,171,000 in 1900.

During the period under consideration exports of merchandise have grown from $70,971,780 in 1800 to $1,487,764,991 in 1901, the per capita in 1800 being $13.37 and in 1901 $18.81. The imports of merchandise have grown from $91,252,768 in 1800 to $823,172,165 in 1901, while the per capita imports have fallen from $17.19 in 1800 to $10.58 in 1901.

Turning to the figures which show the net results of these developments, those relating to wealth, circulation, deposits, &c., the tables show that the wealth has increased from $7,135,780,000 in 1850 to an estimated $94,300,000,000 in 1900; the per capita wealth, from $307.69 in 1850 to $1235.86 in 1900. The public debt, less cash in the Treasury, was in 1865 $76.98 per capita and in 1901 was $13.44 per capita, while the interest on the public debt, which in 1867 was $143,781,592, had fallen to $32,342,797 in 1901. The figures of money in circulation show in 1860 a total of $485,407,252 and in 1901 $2,175,387,277. The circulation per capita in 1860 was $13.85; in 1901, $28.02. The deposits in savings banks in 1830 were $6,973,304; in 1883, 53 years later, they were $1,024,856,787, and by 1901, a further period of only 18 years, had reached $2,597,094,580. Meantime the national banking system had come into operation, and in 1865 the deposits in national banks were $500,910,873; in 1880, $1,006,452,853, and in 1901, $3,044,600,000. The number of depositors in savings banks grew from 38,085 in 1830 to 1,067,061 in 1866 and 6,358,723 in 1901. Railways grew from 9021 miles in 1850 to 199,378 in 1901, and freight carried 1 mile increase from 39,302,209,249 tons in 1882 to 141,162,109,413 tons in 1900, freight rates falling meantime from 1.24 cents per ton per mile to 75-100 cent per ton per mile.

Fletcher, Russell & Co., Limited, of Warrington, England, have favored us with a copy of their "Workshop and Laboratory List, No. 229," which will be interesting to those who handle gas specialties. The first section is devoted to blow pipes for various purposes, with foot blowers and power blowers for furnishing compressed air to be used with them, and the second section contains a variety of muffle furnaces for burning china. A prospector's set, packed in a crate, with all the necessary apparatus for assaying and refining gold, and equipped with furnaces, crucibles, burner coils and tongs is shown, also several styles of crucible furnaces adapted for carbonizing and annealing engraved dies, as well as for melting the softer metals and larger furnaces for melting jewelers' sweepings. Some of the furnaces are so arranged as to be equipped with either gas or oil burners. Furnaces are also shown for heating wire drawers' plates, rivet heating, hardening and annealing, and for heating drills and file blanks, as well as special furnaces adapted for the use of pattern makers and small machine shops. Tobacco presses, japanners' ovens, branding irons, ladle furnaces, tinsmiths' fire pots, self heating soldering coppers, brazing hearths and glue pot heaters occupy another section of the catalogue. The last part is devoted to water heating apparatus, and a variety of burners adapted for the various requirements of those who have to construct special apparatus for using gas fuel.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED FEBRUARY 7, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots .....₱ lb, 87¢
100-lb lots.....₱ lb, 35¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

	Wider than.....	6-in	14-in.	24-in.
	And including.....	14-in	24-in.	30-in.
		₱ lb	₱ lb.	₱ lb.
Nos 13 to 19.....		$0.42	$0.44	$0.47
" 20.....		.44	.46	.49
" 21 to 23		.46	.48	.51
" 24.....		.46	.50	.53
" 25.....		.47	.51	.54
" 26.....		.47	.54	.59
" 27.....		.48	.57	.62
" 28.....		.48	.57	.64
" 29...		.49	.60	.69
" 30.....		.50	.64	.77

Note.—Lots of less than 50 lbs 5¢ ₱ lb extra.

Antimony—

Cookson.....₱ lb. 10¼@10¾¢
Hallett's .. ..₱ lb, 8¼@8¾¢
U. S..... .....₱ lb 8 @8½¢

Brass, Roll and Sheet..... 30%

Conductors—Corrugated.

Round or Square.—

Galvanized ½ or more. N'st'd.....70&5%
" Not Nested.....70&2½%
" Plain Round, ½ or more, Nested .....70&5%
Galvanized, Plain Round, Not Nested. 70&2½%

Spiral Riveted.

Galvanized 40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—

See *Strainers, Conductor.*

Copper—

Lake Ingot..... ...13¾@14 ¢
Casting..... ..... .13¼@13¾¢
Sheet and Bolt.....18¢ ₱ lb basis
Cold Rolled Sheets.....19¢ ₱ lb basis
Cold Rolled and Polished Sheets ..... 20¢ basis
Planished Sheets.....21¢ basis
Bottoms, Pits and Flats....₱ lb 22¢ basis

Eave Trough, Galvanized

Territory.	L. C. L.	
Eastern.....	75&10%	Carloads extra 12½%
Central.....	75&7½%	
Southern.....	70&12½%	
S. Western.....	70&10%	

Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Eastern List.

Tin.....30%
Galvanized..... ....80%
Perfect Elbows.....40%

Stove Pipe—

Four-Piece

	4	4½	5	5½	6-inch.
No. 1.	$0.80	.85	.90	1.00	1.05 per doz.
No. 2.	.65	.70	.75	.80	.85 "
No 3.	.60	.63	.65	.70	.80 "

Elbows and Shoes—

Galvanized 60%

Gasoline—

See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, C. R., Soft Steel.	R. G. Cleaned.
Nos. 14 to 16....	₱ lb. 3.00....	3.85¢
Nos. 18 to 21....	₱ lb, 3.70....	3.75¢
Nos. 22 to 24....	₱ lb, 3.80....	3.85¢
Nos. 25 and 26...	₱ lb, 3.90....	3.95¢
No. 27 ...	₱ lb, 4.00....	4.05¢
No. 28	₱ lb, 4.10....	4.15¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₱ lb 11@14 ¢
Do. Stained.....6@10½¢
Patent Planished. ₱ lb A, 12¢; B, 11¢ net

Galvanized.

Nos. 10 to 16.....	₱ lb, 12¢	67½&5@67½% off
Nos. 17 to 21.	₱ lb, 13¢	
Nos. 22 to 24.....	₱ lb, 14¢	
Nos. 25 to 26.....	₱ lb, 15¢	
No. 27.....	₱ lb, 16¢	
No. 28.....	₱ lb, 17¢	
No. 29.....	₱ lb, 19¢	
No. 30.....	₱ lb, 21¢	

86 in. 1¢ ₱ lb higher.

Lead—

American Pig..... .....4.45@4½¢
Bar..... .....5@5½¢
Pipe..... .....6½¢.....2½ off
Tin Lined Pipe.....12½¢.....20% off
Block Tin Pipe ..... .35 ¢.....20% off
Sheet Lead..... .....7¼¢.....20% off
Old Lead in exchange, 3½¢ ₱ lb.

Mitres, Eave Trough—

See *Eave Trough Mitres.*

Nickel—

Per lb.....60@65¢

Paints, Oils, &c.—

Leads—

Lead, American White, in Oil; Lots of 500 lb or over.....6¼ @ 6½
Lots less than 500 lb.....6½ @ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price..... .. @ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price .... @ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price. .. @ 1½
Lead, White, Dry in hhls.....5¾ @ 6
Lead, Red, bbls., ½ hhls. and kegs: Lots 500 lb or over..... .. @ 6
Lots less than 500 lb .... @ 6¼

Oils—

Linseed, City, raw.....₱ gal.....63@64¢
Linseed, City, boiled.....65@66¢
Linseed State and West'n, raw..62@63¢

Spirits Turpentine—

In Southern hhls.....45 @45½¢
In machine hhls.....46 @46½¢

Putty—

In bulk.....$1.25
In bladders..... .....2.25
In cans 12 lb to 25 lb..... .....2.25
In cans 1 lb to 5 lb..... .....3.25

Petroleum Products—

In Barrels (Barrel included)

Stove Gasoline.....₱ gal. 11½@11¢
Kerosene..... ₱ gal. 12@13¢

Pipe, Drain..... ....40%

Pipe, Spiral—

See *Conductors.*

Registers—

List Sept. 2, 1901.

Black Japanned.....60&10@60&10&5%
White Japanned.....60&10@60&10&5%
Nickel Plated.....60&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze..... 60&10@60&10&5%
Electroplated in Brass, Bronze or Copper..... ...60&10@60&10&5%
White Porcelain..... .....60%
Solid Brass and Bronze Metal.....50%

Roofing Material—

1 Ply Tarred Paper. ₱ ton.$30.00@31.00
2 Ply Tarred Paper...₱ roll, 108 sq. ft. 50@55¢
3 Ply Tarred Paper..₱ roll, 108 sq. ft. 70@75¢
Slater's Felt.....roll 500 sq. ft., 50@60¢
Roofing Pitch.....₱ bbl. $3.38

Rosin—

Common and Good—Strained.

Rosin, C. & D.....₱ bbl. $1.55 @$1.60
Rosin, E. & F.....₱ bbl. 1.60 @ 1.65
Rosin, G. & H ....₱ bbl. 1.70 @ 1.75
Rosin, I. & K ....₱ bbl. 1.95 @ 2.60
Rosin, M. & N.....₱ bbl. 3.00 @ 3.60

Shoes and Elbows—

See *Elbows and Shoes.*

Slate Roofing—

f. o. b. cars, Quarry Station. According to size.

Pennsylvania:
Best Bangor, ₱ sqr. .. ...$3.25@$4.50
No. 1 Bangor Ribbon. ₱ sq 3.00@ 3.50
Pen Argyle, ₱ sqr..... 3.00@ 3.75
Peach Bottom, ₱ sqr..... 4.85@ 5.60
No. 1 Boys, ₱ sqr..... 3.35@ 3.55
No 1 Chapman Keystone ₱ sqr .... 3.25@ 4.25
Vermont:
Sea Green, ₱ sqr.....$2.00@$3.25
Purple, ₱ sqr .... 3.75@ 4.25
Unfading Green, ₱ sqr... 3.25@ 4.50
Red, ₱ sqr ..... 7.00@11.00
Maine:
Brownville, Unfading Black:
No. 1 quality..... .....$5.25@7.50
No. 2 quality..... ..$4.25@0 00

Solder—

½&½ guaranteed..... ..... 16½@17¢
No. 1..... .....14@15½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	—Per Pound.— Barrels	Smaller Q'ntities
Concentrated Flux.....	4c	5c
Eureka Flux:		
Triple Strength...	3c	3½c
Extra Concentrated.....	4½c	5c
Crystal..... ..		7c
Gedney's Fluid.....	2c	2c
Lennox Fluid.....	2c	3c
Perfection Flux.....	3c	3½@1c
Yager's Salts, 1 lb. bottles.....	each, 50¢	
5 lb. bottles, per lb., 45¢		

Soldering Coppers—

Per lb..... 20@22¢

Spelter—

Western Spelter.. .....4½@4¾¢

Spiral Pipe—

See *Conductors.*

Stove Pipe Elbows—

See *Elbows, Stove Pipe.*

Stove Trucks—

See *Trucks, Stove.*

Strainers, Conductor—

Galvanized..... . .....50%

Tin Pigs and Bars—

Banca, pigs, ₱ lb..... .....24½@25 ¢
Straits, pigs, ₱ lb..... .....24½@25 ¢
Straits, in bars, ₱ lb..... .....25½@26 ¢

Tin Plates, American Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:
IC, 14 x 20..... ....$7.50
IX, 14 x 20.... . ..... 9.00
IXX, 14 x 20..... .....10.25
IXXX, 14 x 20..... .....11.50
IXXXX, 14 x 20..... .....12.75

Melyn Grade:
IC, 14 x 20..... ..... 7.00
IX, 14 x 20..... ..... 8.50
IXX, 14 x 20..... ..... 9.75
IXXX, 14 x 20 ....11.00
IXXXX 14 x 20.... ....12.25

Allaway Grade:
IC, 14 x 20..... .... 6.50
IX, 14 x 20 .... 7.60
IXX, 14 x 20..... .... 8.70
IXXX, 14 x 20 ..... . 9.80
IXXXX, 14 x 20. .....10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B Grade, full weight } IC, 14 x 20. .....$5.00@5.25
" " IX, 14 x 20.....$6.00@6.25

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:
100 lb.....15¢
95 lb..... .....20¢
90 lb.....25¢
85 lb..... .....30¢

Terne Plates—

N. B.—The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance for 8 to 10 lb coating and $2.50 to $3 advance for 15 lb and upward.

About 40 lb coating.. ..... $16.00@16.50
About 30 lb coating..... 15.25@15.75
About 20 lb coating..... 13.25@13.75
About 15 lb coating..... 11.25@11.75
About 8 lb coating..... .....@10.00

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $12.50
IXX, 14 x 28..(112 sheets)..... 13.50
IXX, 14 x 31..(112 sheets)..... 15.00

Troughs, Eave—

See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₱ doz... 18.00

Tubes and Tubing—

Braze 1 Brass, List June 6, 1898 .....40%
Copper and Bronze, 3c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb. 6, 1899
Tin.....50%
Galvanized.....50%
Fittings for do.....40%

Zinc—

600 lb casks ₱ lb.....6¾¢
Per lb. ....7½¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
80 gal.....70&10%
85 and 40 gal.....70%
Other sizes up to 52 gal....60@00&10%
52 gal. and above..... .....00%
Extra Heavy Boilers:
18 to 52 gal 60%
53 gal. and above 55%

Brass Work, Plumbers'—

List of December 7, 1896.

Compression:
Basin Cocks.....60%
Bath Cocks and Double Bath Cocks.. 65%
Bibs. 05%
Bibs, Flanged.....65%
Fuller:
Bibs..... .....70%
Basin Cocks Nos. 1 to 4..... ....70%
Bath Cocks, No. 4½.....$2.40 each net
Ground Key Work:
Finished Bibs..... .....55&5%
Rough Bibs and Stops..... 70%
Rough Stop and Stop and Waste Cocks.....70@70&5%
Rough Stop and Stop and Waste Cocks, Patented..... 65@05&5%

Miscellaneous—

Basin Clamps.....60@65%
Basin Plugs.....60@65%
Chain Stays. ....60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face..₱ set	$0.95	$1.05
Ground Face ₱ set	31.00	$1.10

Sink or Bath and Wash Tray Plugs.60@65%
Soldering Nipples.....70&5@75%
Soldering Unions .....70&5@75%
Union Elbows, Hot Water Heating.... 75@75&15%

Cocks, Valves, &c.—

Cocks—

Brass—

Air and Radiator Air .....75@75&5%
Gas Meter and Union Meter.....65@70%
Steam..... .....65@70%

Iron—

All Iron.....70@70&10%
Iron with Brass Plugs.....65@70%

Valves—

Brass—

Check..... ....65@70%
Garden Hose..... .....65&10@70%
Gate..... .....65@65&10%
Globe and Angle, hose outlet.65@65&10%
Globe, Angle and Cross.. .65&10@70&5%
Horizontal, Vertical and Angle Check... 65@65&10%
Hot Water Radiator 75%
Radiator..... .....70&10%
Safety..... .....05%
Safety, Low Pressure..... .....05%
Jenkins' Disc:
Check... ....65%
Gate..... .....65%
Globe, Angle and Cross.....70%
Radiator..... .....80%
Radiator, Corner..... .....75%
Safety..... .....65%

Iron—

Iron Body..... .....70@70&5%
Foot..... .....65@70%
Jenkins Bros.':
All Iron, except Gate.....40&5%
All Iron Gate..... .....35@40%
Iron Body, except Gate..... .....60%
Iron Body Gate..... .....50@50&5%
Swing Check..... ....50%

Earthenware—

Brown Glazed Wash Tubs..... .....20%
Brown Glazed Sinks, Kitchen and Pantry 20%
Basins, Urinals and Hoppers.....45%
Closet Bowls, Sundries, Washouts and Pedestals..... ... .50%

Fittings—

Brass Fittings—

Finished.....70@75%
Rough .....70@75%
Bushings.....70@75%
Nipples..... .....70@70&2½%
Unions, Rough and Finished....70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....65@70%
Cast Iron Bushings and Plugs....65@75%
Cast Iron Flanges.....05@70%
Cast Iron Floor Flanges.....65@75%
Malleable Iron Fittings..... ...70@75%
" " Bushings.....70@70&10%
" " Unions..... ...70&10@75%
" " Unions, Flange 60&10@70%
" " Pipe Hangers, Universal 50%
Wrought Iron Nipples.....70@75%
" " Couplings.....60@05%
" " Long Screws.....60@65%

Lavatories—

Porcelain Enameled Iron.....80@80&10%

Oakum—

Plumbers' Oakum, 50 lb. bales, ₱ lb 2½¢

Pipe—

Brass, Iron Pipe Size—

⅛	¼	⅜	¾ to 3 Inch
$0.33	.31	.29	.23 ₱ lb

Cast Iron Soil—

List Feb. 25, 1901.
2 to 6 inch inclusive.

Standard..... .....60&5%
Extra Heavy..... ...65@70%
All Fittings.....70@70&10%

Wrought Iron—

List Feb. 15, 1900.

	Black.	Galv.
⅛ to ½ inch.....	57%	48%
¾ to 12 inch.....	64%	51%

NOTE.—*Manufacturers' prices are much lower than above, but prompt shipments are not obtainable.*

Radiators—

Standard List.

Steam.....50&2½%
Hot Water..... .....50%

Sinks, Etc.—

	Cast Iron—Black.	Galv.
Sinks, Square, Half Round and Corner...	60@05%	60@05%
Sink Legs.	60%	60@65%
Sink Backs	60%	60@65%
Boiler Stands, Cast Iron.....	60@60&10%	
Cesspools, Cast Iron.....	60%	

Wrought Steel Sinks—

New Era, Galv'd and Enameled. ..70&5%
New Era, Painted.....50&10%
L. & G..... ....50%

Traps—

Drawn Lead Traps, List June 3, 1901..... 55&55&5%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns, Guaranteed, 45@50%
All Special Patterns..... ....25%
Non-guaranteed Brands, complete line ....45@50%
Solid Copper, list of Feb. 1, 1899.....40%
Solid Porcelain—Class A, 30%: B, 40%: C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899.. .. ..50@55%

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Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Fire Pots.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Detroit, Mich.

Fire Sets.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Furnace Cement.
Rutland Fire Clay Co; Rutland, Vt.

Furnace Pipe and Fittings.
International Heater Co., Utica, N. Y.
Osborn, J. M. & L. A., Cleveland, O.

Furnaces and Heaters.
Amer. Furnace Co., St. Louis Mo.
Barstow Stove Co., Providence, R.I.
Beckwith, P. D., Est. of, Dowaglac, Mich.
Bergstrom Bros. & Co, Neenah, Wis.
Bonnot Co., Canton, O.
Brand Stove Co., Milwaukee, Wis.
Bulen Heater Co., Hoosick Falls, N. Y.
Cory, Uzal & Co. 210 Water St., N. Y.
Dighton Furnace Co., Tauuton, Mass.
Floyd, Wells & Co., Royersford, Pa.
Giblin & Co., Utica, N. Y.
Graff Furnace Co., 208 Water Street, New York.
Hart & Crouse Co., Utica, N. Y.
International Heater Co., Utica, N. Y.
Kelsey Heating Co., Syracuse, N. Y.
Leonox Manufacturing Co., Marshalltown, Iowa.
Magee Furnace Co., Boston, Mass.
Mueller, L. J. Furnace Co., Milwaukee, Wis.
Peck-Williamson Co., Cincinnati, O
Richmond Stove Co., Norwich, Conn
Schwab, R. J. & Sons Co., Milwaukee, Wis.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Ct.
Stanton Heater Co., Martins Ferry, O.
Tubular Heating and Ventilating Co., Phila., Pa.
Utica Heater Co., Utica, N. Y.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Graulte Steel Ware.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Groovers.
Wheeler, W. A., Indianapolis, Ind.

Gutter Formers.
Double Truss Cornice Brake Co., Buffalo, N. Y.

Heat Regulators.
Æolipyle Co., 117 Beekman St., N. Y.
Howard Thermostat Co., Oswego, N. Y.

Heaters, Steam and Hot Water.
Barstow Stove Co., Providence, R.I.
Dighton Furnace Co., Tauuton, Mass.
Drake, W. H., Newark, N. J.
Gorton & Lidgerwood Co., 98 Liberty St., New York.
Gurney & Co., Boston, Mass.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
International Heater Co., Utica, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Magee Furnace Co., Boston, Mass.
Mueller, L. J. Furnace Co., Milwaukee, Wis.
National Pipe Bending Co., New Haven, Conn.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.
Richmond Stove Co., Norwich, Conn.
Sheppard, Isaac A. & Co., Phila., Pa
Smith, H. B. Co., Westfield, Mass.
Smith & Anthony Co., Boston, Mass.
Smith & Thayer Co., Boston, Mass.
Stolz, Frank D., Chicago, Ill.
Utica Heater Co., Utica, N. Y.
Vance Boiler Works, Geneva, N. Y.
Wireton Heating Co., Blue Island, Ill.

Hollow Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
National Enameling & Stamping Co., 78 Beekman St., N. Y.
Sperry, D. R. & Co., Batavia, Ill.

Hotel Cooking Apparatus.
Smith & Anthony Co., Boston, Mass.

Household Specialties.
Shepard, Sidney & Co., Buffalo, N. Y.

Ice Cream Dishers.
Seavey Mfg. Co., Boston, Mass.

Ice Cream Freezers
White Mountain Freezer Co., Nashua, N. H.

Iron, Galvanized Sheet. (*See Sheets, Galvanized.*)

Iron and Steel, Sheet. (*See Sheets, Iron and Steel.*)

Iron, Planished Sheet.
Amer. Sheet Steel Co., New York.

Iron Shutters and Doors.
Garry Iron & Steel Co., Cleveland, O.

Lath, Metallic.
Schratwiesers Metal Lath Works.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lead Washers.
Littleford Bros., Cincinnati, O.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Lunch Boxes.
Seavey Mfg. Co., Boston, Mass.

Manufacturing Sites.
Chamber of Commerce, Muskegon, Mich.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Munsell, Eugene & Co., 218 Water St., New York.
Ohio Mica Co., Canton, Ohio.
Palermo Mica Co., 115 Beekman St., N. Y.
Rutland Fire Clay Co., Rutland, Vt.

Milk Cans.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Nickel Plating Outfits.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. Twenty-fifth St., New York.

Oil Heaters. (*See Stoves and Ranges, Oil, Vapor and Gasoline.*)

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.
Monarch Stove & Mfg. Co. Mansfield, Ohio.

Patent Solicitors.
Hamlin, H. R., Washington, D. C.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Patterns.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio
Vedder Pattern Wks., Troy, N. Y.

Perforated Sheet Metal.
Harrington & King Perforating Co., Chicago, Ill

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pipe Cutting and Threading Machines.
Curtis & Curtis Co., Bridgeport Ct
Saunders, D. Sons, Yonkers, N. Y.

Pipe Joint Cement.
Callahan, Geo. & Co., 218 Front Street, N. Y.

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Lamb & Ritchie, Cambridge, Mass.

Pipe Vises.
Walworth Mfg. Co., Boston, Mass.

Pipe, Water and Gas.
Millar, C. & Son Co., Utica, N. Y.

Pipe Wrenches.
Trimont Mfg Co., Roxbury, Mass.

Plumbers Tools, Specialties and Supplies.
Anderson Coupling Co., Portland, Ct.
Barstow Stove Co., Providence, R. I.
Clayton & Lambert Mfg. Co., Detroit, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Foster, F. W. Mfg. Co., Boston, Mass.
Lamb & Ritchie, Cambridge, Mass.
National Pipe Bending Co., New Haven, Conn.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.
Walworth Mfg. Co., Boston, Mass.
Young, Jos. H., Boston, Mass.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y

Pipers, Pipe Expanding.
Anderson Coupling Co., Portland, Ct.

Pokers and Lifters.
Shields, W. H. & Co., Troy, N. Y.
Stover Mfg. Co., Freeport, Ill.
Troy Nickel Works, Troy, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St. Brooklyn, N. Y.

Press Work.
Kirk Mfg. Co., Toledo, O.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Swame, F. J. Co., St. Louis, Mo.

Pumps
Lawless, John H., Jersey City, N. J.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Robinson, J. M. Mfg. Co. Cincinnati, Ohio.
Toledo Mach. & Tool Co., Toledo, O.

Radiator Shields.
Twin Burner Vapor Stove Co., St. Louis, Mo.

Radiators, Hot Air.
Burton, W. J. & Co., Detroit, Mich.
Independent Register Co., Cleveland, Ohio.

Radiators, Steam and Hot Water.
Gurney Heater Mfg. Co., Boston, Mass.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.

Range Boilers.
Koven, L. O. & Bro., 50 Cliff St., N. Y.

Reflectors.
Frink, I. P. 551 Pearl St., New York.

Refrigerators.
Challenge Refrigerator Co., Grand Haven, Mich.
Cooper & McKee, Brooklyn, N. Y.
Gurney Refrigerator Co., Fond du Lac, Wis
Wisconsin Refrigerator Co, Eau Claire, Wis.

Registers.
Canton Steel Roofing Co., Canton, O.
Dighton Furnace Co., Taunton, Mass.
Independent Register Co., Cleveland, Ohio.
Seavey Mfg. Co., Boston, Mass.

Roasters and Bakers.
Shepard, Sidney & Co., Buffalo, N. Y

Roofing.
Asphalt Ready Roofing Co., 136 Water St., N. Y.

Roofing Cement and Paint.
Callahan, Geo. & Co., 218 Front Street, N. Y.
Dixon, Jos. Crucible Co., Jersey City N. J.
Rutland Fire Clay Co., Rutland, Vt.

Roofing Cork
Stowell Mfg. Co., Jersey City, N. J.

Roofing Edger.
Danzer Metal Works, Hagerstown, Md

Roofing and Siding, Iron and Steel, Corrugated and Plain.
Berger Mfg. Co., Canton, O.
Burton, W. J. & Co., Detroit, Mich.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Co., Cleveland, O.
Gummey McFarland & Co., Phila., Pa.
New York Iron Roofing & Cor. Co., Jersey City, N. J
Reeves Mfg. Co., Canal Dover, O.

Roofing Nails.
Salem Nail Co., 279 Pearl St., N. Y

Roofing Slate.
Bray, J. & Co., E. Bangor, Pa.
Gall, John & Sons, 54 Broadway, N. Y.
Genuine Bangor Slate Co., Easton, Pa.
Johnson, E. J. & Co., 38 Park Row, N. Y.
O'Halloran & Jacobs, Pittsburgh, Pa.

Sap Pails.
Shepard, Sidney & Co., Buffalo, N. Y.

Sap Spouts.
Millar, C. & Son Co., Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.

Screens.
Harrington & King Perforating Co., Chicago, Ill.

Sewer Pipe.
Rutland Fire Clay Co., Rutland, Vt

Shears, Sheet Metal
McSherry, Chas., Pittsburgh, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y
Excelsior Tool & Mch. Works, St. Louis, Mo.
Keene Geo. C. & Co., Cincinnati, O.

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Miner & Peck Mfg. Co.. New Haven, Conn.
Niagara Machine & Tool Wks.. Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co.. 27 Murray St.. New York.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, F. J. Co., St. Louis, Mo.

Sheets, Galvanized.
American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
McClure & Co., Pittsburgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Alan Co.. Philadelphia. Pa.

Sheets, Iron and Steel.
American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co.. Phila., Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Co., Alan Philadelphia. Pa

Shingles and Tiles, Metallic.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.
Penn Metal Ceiling & Rfg. Co., Phila., Pa.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Siding. *(See Roofing and Siding.)*

Sinks.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.

Skylights.
Canton Steel Roofing Co., Canton, O.
Drouve, G. Co., Bridgeport, Conn.
Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 279 Pearl St., N. Y.

Smoke Test Machine.
Gunster & Forsyth, Scranton, Pa.

Snow Guards.
Clason Arch. Metal Works, Providence, R. I.

Solder.
Bruce & Cook, 186 to 190 Water St., N Y
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Burgess Soldering Furnace Co., Columbus, Ohio.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St. N. Y.

Specialties, Sheet Metal.
Vogel, Wm. & Bros., Brooklyn, N. Y.

Steam and Gas Fitters' Supplies.
Curtis & Curtis Co., Bridgeport, Conn.
Walworth Mfg. Co., Boston, Mass.

Steam and Water Engineering and Regulating Specialties.
Kieley & Mueller, 7-11 West 13th St., N. Y.

Steel Shapes.
Cambridge Rolling Mill Co., Cambridge, Ohio.

Steel Stamps and Stencil Dies.
Schwerdtle Stamp Co., Bridgeport, Ct.

Stove Bands.
Kirk Mfg. Co., Toledo, O.

Stove Cement.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Rutland Fire Clay Co. Rutland, Vt.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge N. J.
Williams Stove Lining Co., Taunton, Mass

Stove and Metal Polish.
Hoffman Geo. W., Indianapolis, Ind.
Rutland Fire Clay Co., Rutland, Vt.

Stove Patterns.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Milwaukee Pattern Works, Milwaukee, Wis.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
City Forge & Iron Works, Dayton, O.
O. K. Mfg. Co, Buffalo, N. Y.

Stove Repairs.
Clark, Henry N. Co., Boston, Mass.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
Banner Mfg. Co., Cleveland, O.
Shields W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stoves and Ranges.
Barstow Stove Co., Providence, R. I
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Brand Stove Co Milwaukee, Wis.
Detroit Stove Works, Detroit, Mich.
Dighton Furnace Co., Taunton, Mass
Eclipse Stove Co., Mansfield, O.
Enterprise Stove Co. Vincennes, Ind.
Floyd, Wells & Co., Boyersford, Pa.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co, Utica, N. Y.
Graff Furnace Co., 208 Water Street, New York.
Gurney & Co., Boston, Mass.
Magee Furnace Co., Boston, Mass
Quincy Fdry. & Novelty Co. Quincy, Ill.
Richmond Stove Co., Norwich, Conn.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, O.
Shcooard, Isaac A. & Co., Phila., Pa.
Smith & Anthony Co., Boston, Mass.
Stamford Foundry Co., Stamford, Ct.
Twin Burner Vapor Stove Co., St. Louis, Mo.
Weir Stove Co., Tauntoo, Mass

Stoves and Ranges, Gas.
Adler H. & Co., Pittsburgh, Pa.
Detroit Stove Works, Detroit, Mich.
Dighton Furnace Co., Taunton, Mass.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
National Vapor Stove & Mfg. Co. Lorain, O.
Ringen Stove Co., St Louis, Mo.
Schneider & Trenkamp Co., Cleveland, O
Taylor & Boggis Foundry Co., Cleveland, O.
Twin Burner Vapor Stove Co., St. Louis, Mo.

Street Lamps, Gasolene.
Merkel, H., St. Louis, Mo.

Tanks, Steel and Wood.
Edwards, J H., 59 Park Place, N. Y.

Terne Plates.
American Tin Plate Co., New York.
Taylor, N. & G. Co., Phila., Pa

Tinners' Tools, Machines and Supplies.
Berger Bros. Co., Phila., Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn N. Y.
Weiss, H. & Co., 20 Cliff St., N. Y.

Tinners' Trimmings.
Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate
American Tin Plate Co., New York.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

Tin Scrap.
Vulcan Metal Refining Co., 157 Cedar St., N. Y.
Vulcan Western Co., Streator, Ill.

Tinware.
Shepard, Sidney & Co., Buffalo, N. Y.

Tools and Machines, Steam and Gas Fitters'.
Curtis & Curtis Co., Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Torches, Plumbers.
Clayton & Lambert Mfg. Co., Detroit, Mich.

Tubing.
Kirk Mfg. Co., Toledo, O.

Valves.
Am. Steam Gage & Valve Mfg. Co., Boston, Mass.
Crosby Steam Gage & Valve Co., Boston, Mass.
Jenkins Bros., 71 John St., New York.
Morgan & Co., Chicago.

Ventilating Apparatus.
American Blower Co., Detroit, Mich.

Ventilators and Chimney Caps.
Berger Bros. Co., Phila., Pa.
Bowman Mfg. Co., Atlanta, Ga.
Fenn, Geo. E., Boston Mass.
Globe Ventilator Co., Troy, N. Y.
Kramer Bros., Dayton, O.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros. Cincinnati, O.
Marston, I. G. & Co., Boston, Mass,

Washing Machines.
Wayne Anthony Mfg. Co., Ft. Wayne, Ind.

Water Coolers.
National Enameling & Stamping Co., 78 Beekman St., N. Y

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Water Fronts.
Clark, Henry N. Co., Boston, Mass.

Water Heaters.
Adam, W. J., Joliet, Ill.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.
Miner & Peck Mfg. Co., New Haven, Ct.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Official letters of reference should not be inclosed with replies to advertisements appearing in these columns as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

FOUNDRY SUPERINTENDENT with knowledge of molding; must have executive ability to manage men and get work out to advantage; special experience in our line of work not required; state experience, age and references; good position and salary for right man. Richmond Stove Company, Norwich, Conn. Feb. 8

A first-class, steady and sober TINSMITH; must be fast on wash boilers and good on bakers' and confectioners' supplies; wages from $2.50 to $3 per day to the right man; must come to Washington at once. J. Melncove, 1311 Seventh street, N. W., Washington, D. C. Feb. 8

A FOREMAN to take charge of pieced tinware department in sheet metal goods factory; must know how to make good tinware; state experience and salary expected. Address Box 11, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill.

As ASSISTANT SUPERINTENDENT of a stove concern, a man between 35 and 45 years of age, who has had experience of the mounting, nickel plating and general finishing of stoves and furnaces. Apply, giving testimonials and stating salary, to the Gurney Foundry Company, Toronto, Can. Feb. 8

A first-class man, with good references, to take charge of our casting department; steady job to the right man. F. & L. Kahn & Bros., Hamilton, Ohio. Feb. 8

A first-class PLUMBER and TINSMITH; no other need apply; state wages. John H. Newbury, Bay Shore, N. Y. Feb. 8

A first-class TINNER for inside and outside work; one that has knowledge of plumbing; must be strictly temperate; none but first-class mechanic need apply; steady position to the right man. C. B. Hodges, Depew, N. Y. Feb. 8

A WORKING FOREMAN to take charge of a tin and cornice shop; must be capable of detailing, cutting and constructing galvanized iron cornice and skylights, tin roofing, job work and hot air heating; state age and what wages wanted; steady work to the right man; must be temperate. S. M. Subers' Son, 205 Cotton avenue, Macon, Ga. Feb. 8

An all around TINNER, STOVE and FURNACE MAN that has some knowledge of plumbing; must be strictly temperate while about his business; steady job to the right man; state salary wanted. Jno. S. Solenberger & Co., Winchester, Va. Feb. 8

A first-class TINNER for inside and outside work; one that can do some slating preferred; good wages and steady work to the right party. Humphrey Brothers, Greenville, Ohio. Feb. 8

First-class PLUMBER with a fair knowledge of steam and hot water fitting; good pay and steady work to the right man. Willey & Calhoun, Portland, Me. Feb. 8

Industrious SHEET IRON WORKER, with some knowledge of plumbing; able to take an interest in the hardware business; send full particulars. G. Roene, Douglas City, Alaska. Feb. 8

At once, two TINNERS, all around first-class men; $2.50 per day, nine hours. Walter Tillson, 14 North Joachim street, Mobile, Ala. Feb. 8

Experienced man to take charge of cornice, skylight and roofing shop in New York City; must be capable of handling a large number of men; good position to the right man; state age, reference and wages desired. "F. B.," care *The Metal Worker*, New York. Feb. 8

Experienced FURNACEMAN in steel brick set furnace work, having ability to construct and sell furnaces; must have good references; would prefer man to take interest in established business in a city of 70,000 inhabitants. H. G. Roetzel & Co., 513-515 Sycamore street, Evansville, Ind.

For a country hardware house, a good, all-around TINNER with some knowledge of plumbing and gas fitting; must be good in figures; a man that can sell hardware, implements, wagons, carriages and sleighs; a steady job for the right man; answer, giving references and name price. The Gallup Hardware Company, Port Allegheny, Pa. Feb. 1

A first-class PLUMBER; one who is sober and reliable and not afraid of work; steady job to right man; must have first-class reference. Box 553, Newport News, Va. Feb. 1

STOVE SALESMAN, with experience, to travel in Iowa; state age, experience and references, and whether married or single. "Stove Salesman," care *The Metal Worker*, 1205 Chemical Building, St. Louis, Mo. Feb. 1

CORNICE CUTTER, young man, one who can draft and cut own patterns. "Copper," care *The Metal Worker*, New York. Feb. 1

A good all around man for village shop; must be able to do general tin and sheet metal work; steady work to the right man. H. C. Seuffert, Caledonia, Minn. Feb. 1

An A1 PLUMBER, STEAM and HOT WATER FITTER; must understand tin and sheet iron work; must be steady and sober; good pay and steady work the year through to the right man. "Hardware," care *The Metal Worker*, New York. Feb. 1

A good all around man for tin shop and in store; one who understands pump work preferred. R. I. Peatman, Centerville, Iowa. Feb. 1

A first-class TINNER for inside and outside work; one that can do some plumbing; must be strictly temperate while about his business; none but a first-class mechanic need apply; to this man we will give steady work. McCombs & Eddy, Connersville, Ind. Feb. 1

SALESMAN, speaking German or French or both, familiar with pipe and fittings line, to travel foreign countries; good position for right man. Box 9, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 1

By March 1, a first-class TINNER and PLUMBER; applicants state full particulars. The Arcata Hardware Company, Arcata, Cal. Feb. 1

A young man, temperate and reliable, JUNIOR PLUMBER, with some knowledge of tin and gutter work; in growing town on Long Island; permanent position if suitable and suited. "B.," care *The Metal Worker*, New York. Feb. 1

An all around TINNER, FURNACE and PUMP MAN; steady work to the right man; best references required with application; must be steady, sober and industrious; permanent work as long as satisfactory. A. E. Pulver & Co., Sbortsville, N. Y. Feb. 1

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By a young married man with three years' experience at the tinners' trade; would like a chance to finish the trade in Indiana or Ohio; can do slate roofing; am strictly temperate; will work reasonable for a steady job; state wages. Hawk Shaw, 520 Penn street, Muncie, Ind. Feb. 8

A steady position by a first-class IRON STOVE PATTERN FITTER and STOVE METAL PATTERN MAKER; A1 reference. Thos. Woolson, 447 Masten street, Buffalo, N. Y. Feb. 8

A clever all round TIN and SHEET IRON WORKER is open for a good position paying not less than $3 per day; am capable of doing any kind of work that comes to a first-class shop; also up to date on hot air furnace work or the construction of steel ranges and hotel goods; can handle men if necessary; Chicago or St Louis preferred. "C.," 723 W. Mulberry street, Baltimore, Md. Feb. 8

Young man, PLUMBER and GAS FITTER, 24 years of age; temperate and reliable; single; some knowledge of tin roofing and spouting; can go anywhere. F. R. Pentlan, 220 School street, Taunton, Mass. Feb. 8

By STEAM and HOT WATER FITTER; can do plumbing, gas fitting and pump work; married; strictly sober; salary reasonable; can furnish reference from last employer; would prefer employment in New York or an adjoining State. "R. S. F.," care *The Metal Worker*, New York. Feb. 8

Practical PLUMBER wants work; city or country; references; wages moderate. Joseph Fitzpatrick, 224 East Fifty-sixth street, New York. Feb. 8

Young man, 20 years old, would like a position with some good reliable person; out West if possible; has first-class references. T. J. McKenna, 48 Montauk avenue, Brooklyn, N. Y. Feb. 8

By young man, with two and one-half years' experience at furnace work, heating and tinning; am married, 22 years old, temperate and steady; prefer State of Illinois; wages expected, $2 per day. Paul Jackson, 93 Commerce street, Memphis, Tenn. Feb. 8

PLATER; a young man capable of taking charge of polishing and plating department, having ten years' experience with brass and iron; can give best of references. B. E. Miller, 543 Thirteenth street, Detroit, Mich. Feb. 8

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New York PLUMBER would like a steady position outside of city; eight years' experience; moderate wages. Thos. E. Fallon, 1118 Third avenue, New York. Feb. 8

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TINSMITH: all round hand; also good jobbing plumber; city or country. Harry Rosenbloom, 92 Madison street, New York. Feb. 8

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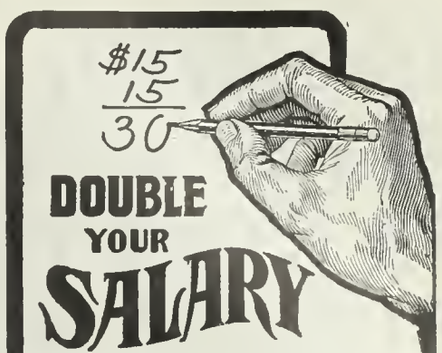
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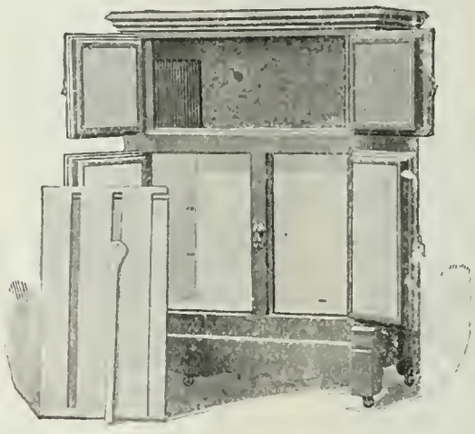
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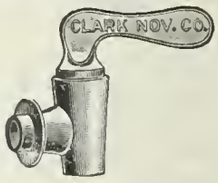
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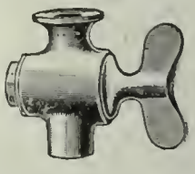


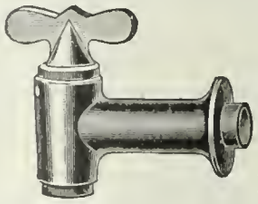


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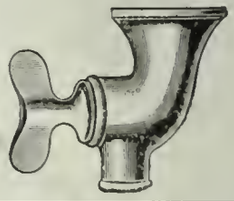


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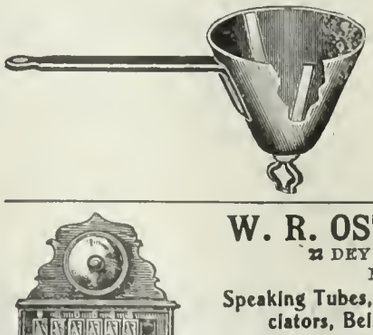




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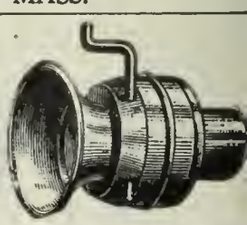


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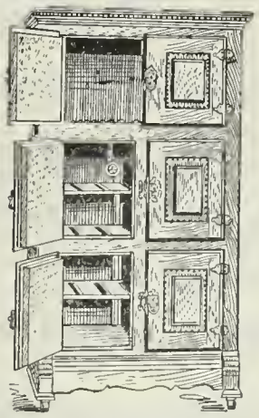
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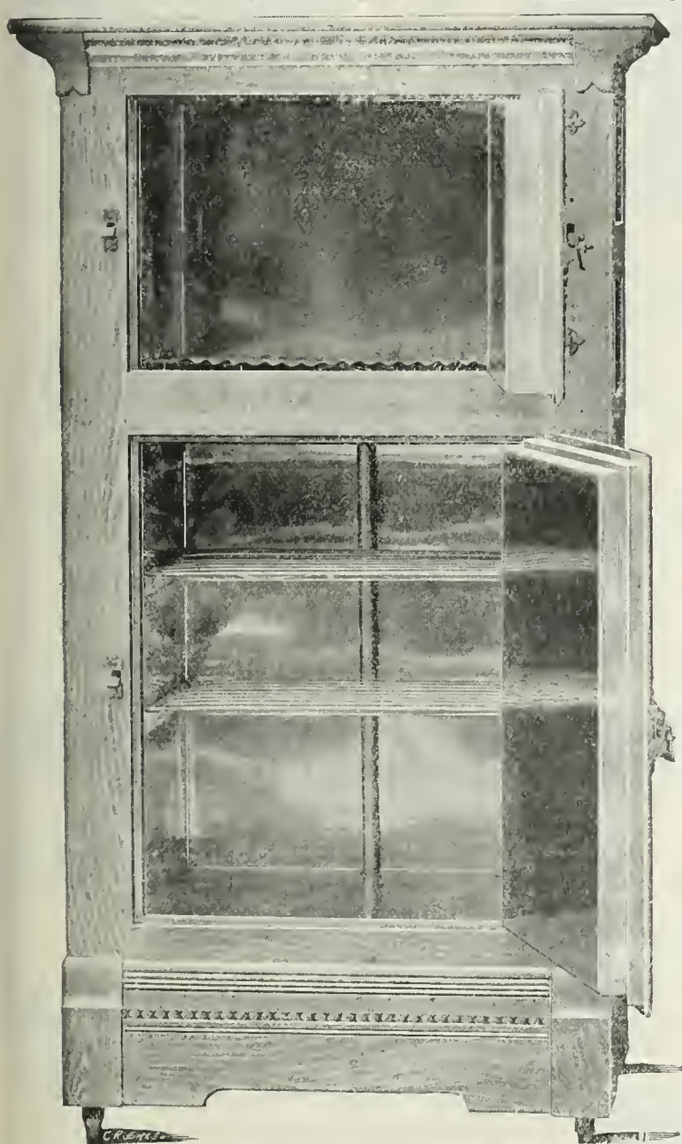
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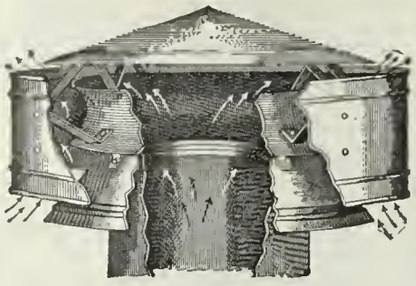
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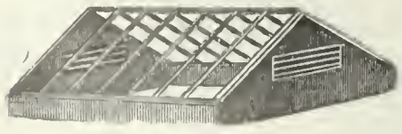
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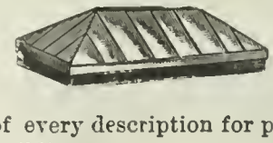
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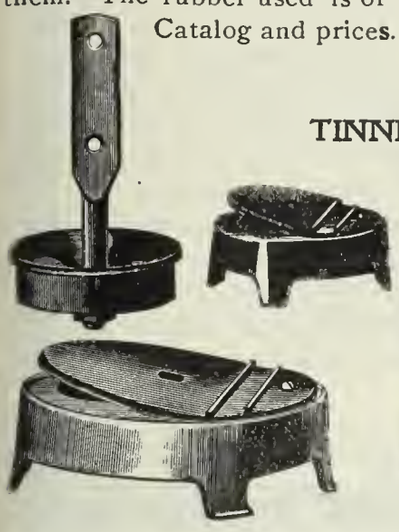
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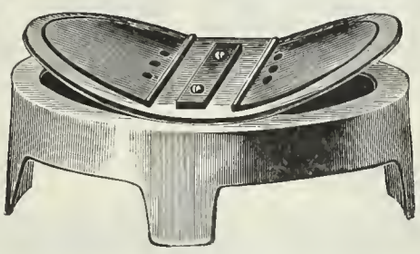


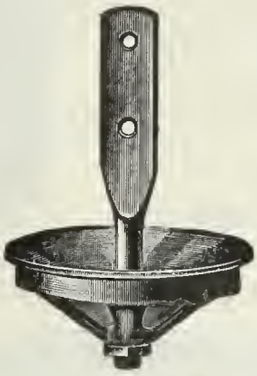
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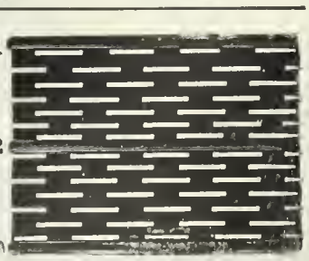
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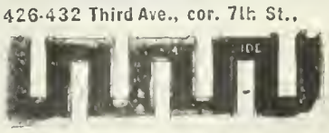
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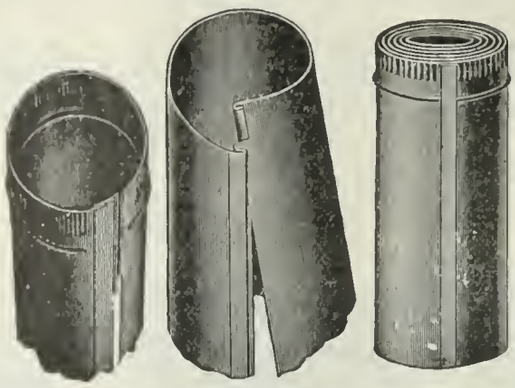
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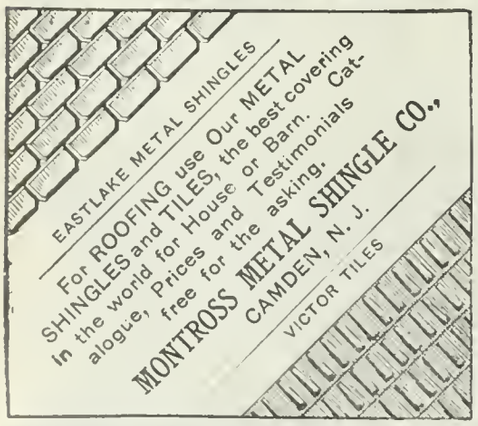
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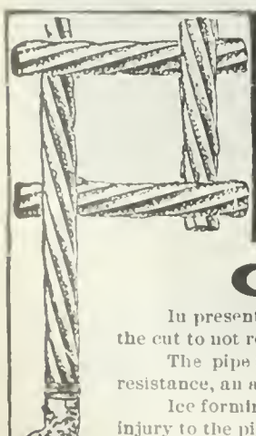
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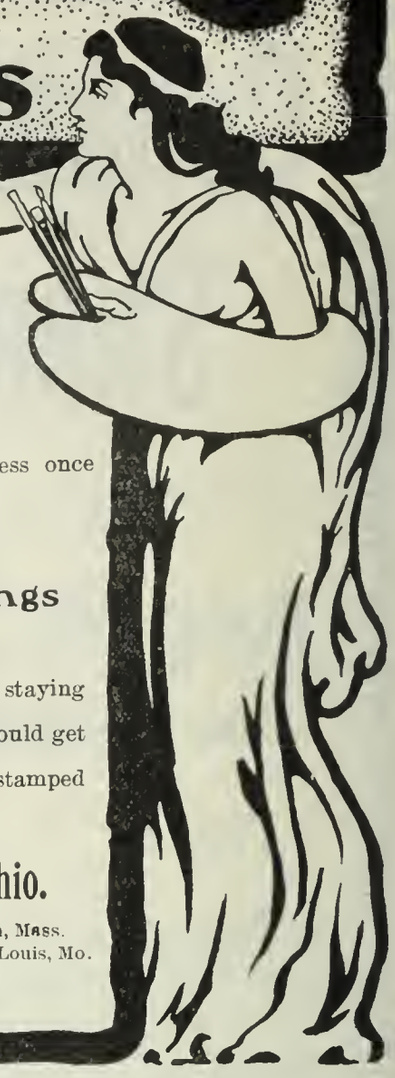
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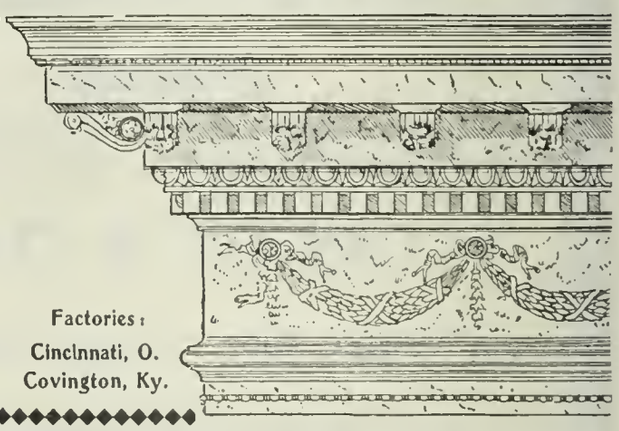
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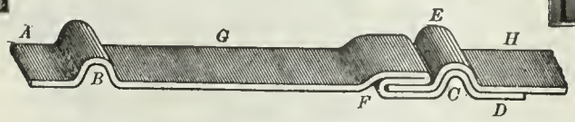
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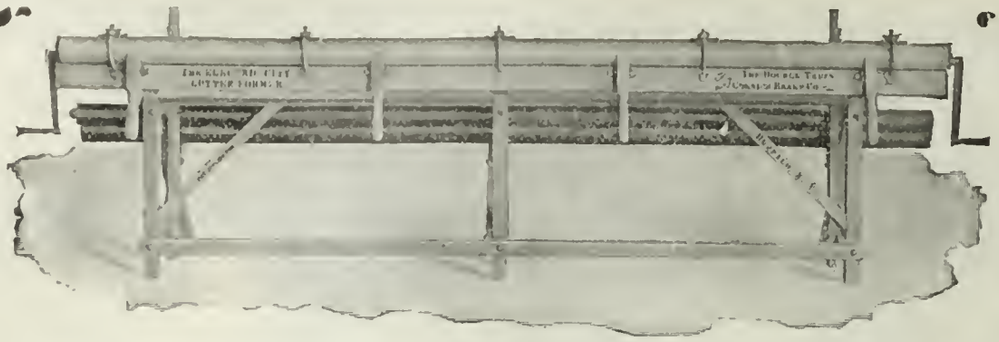
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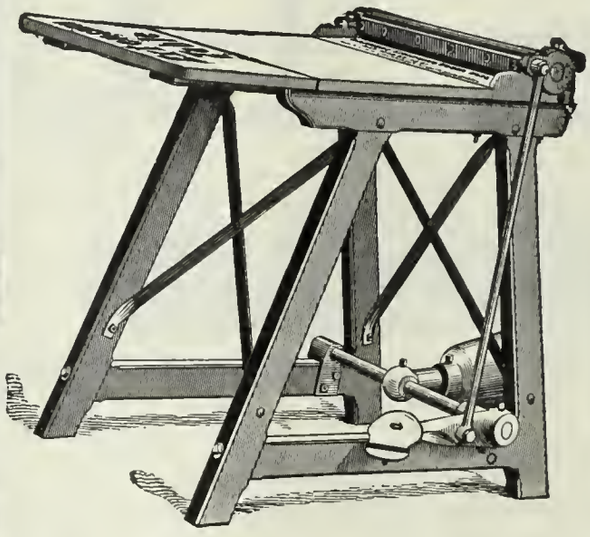
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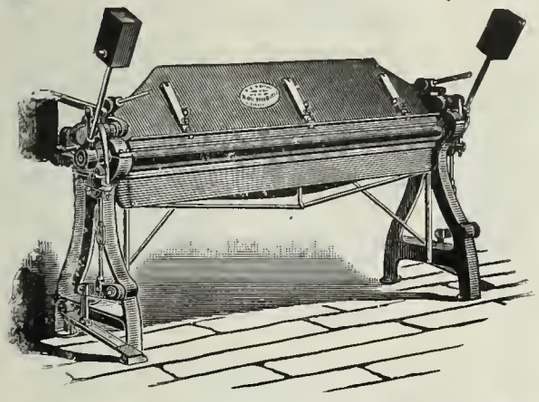
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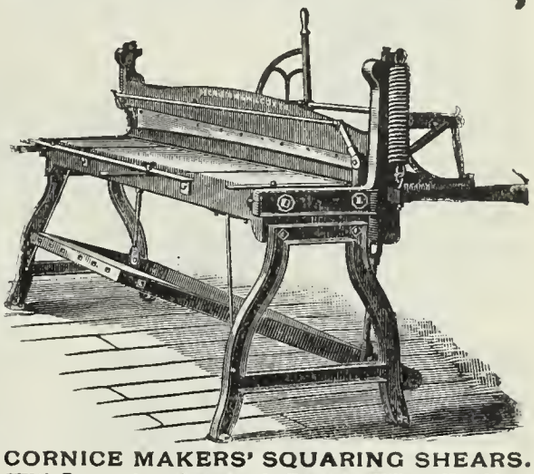
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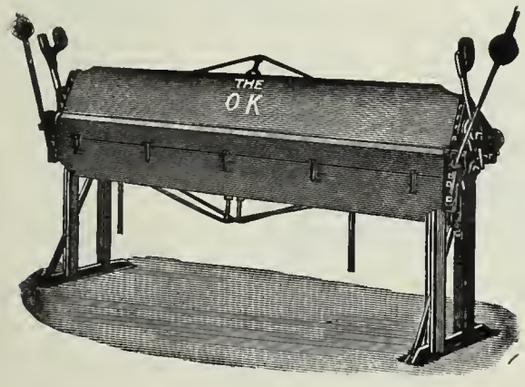
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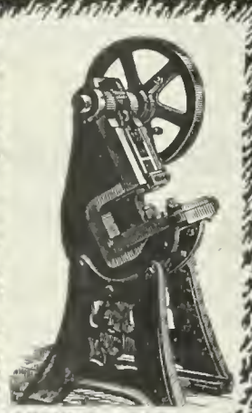
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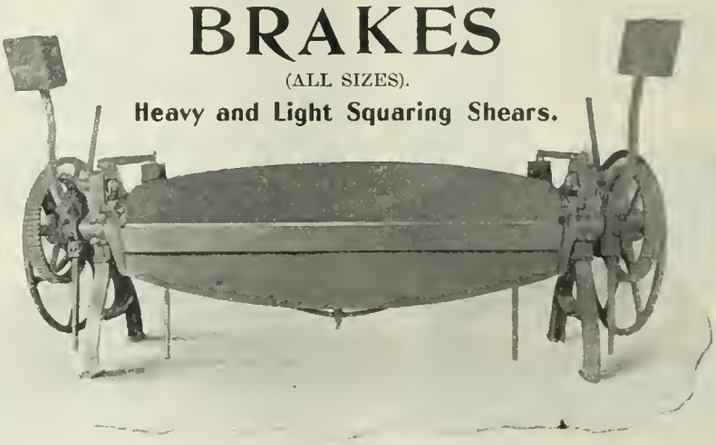
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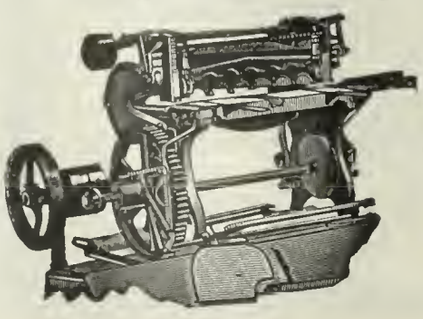
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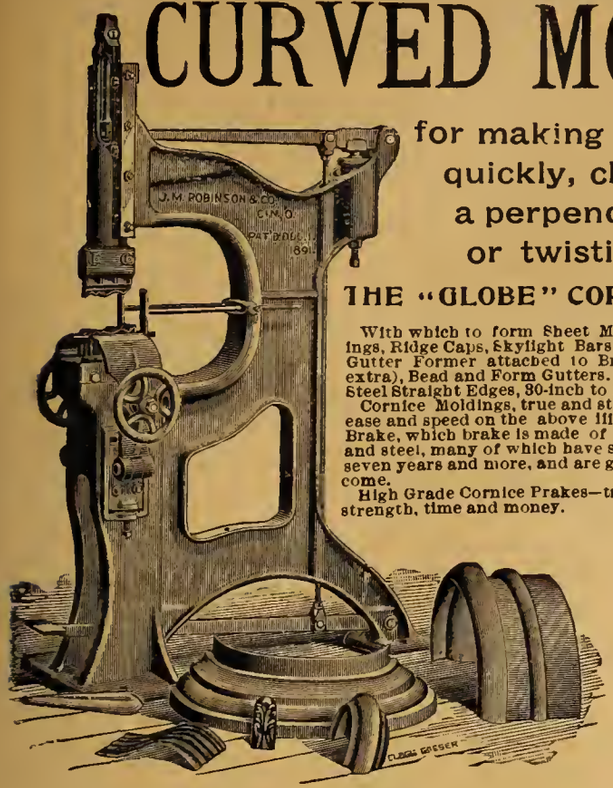
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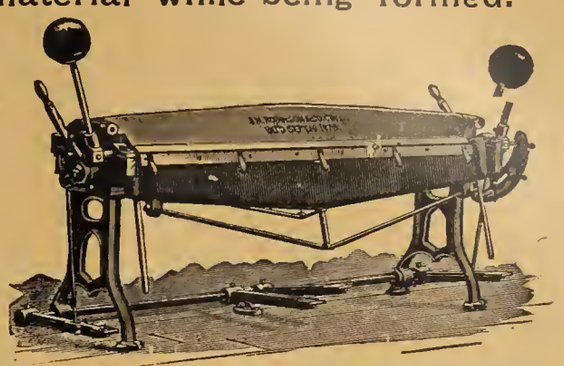
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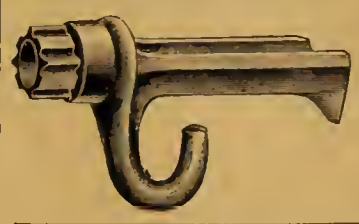
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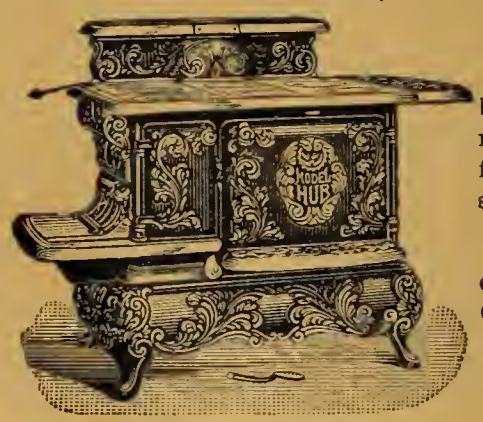


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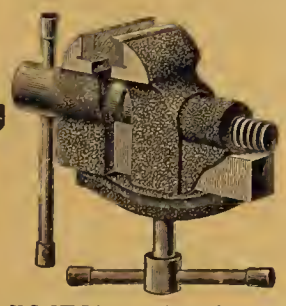
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Suitable for high or low pressure. Take no more room than an ordinary air cock. Endorsed by the leading steam experts as the best made and the quickest working. All genuine stamped with our Trade Mark.

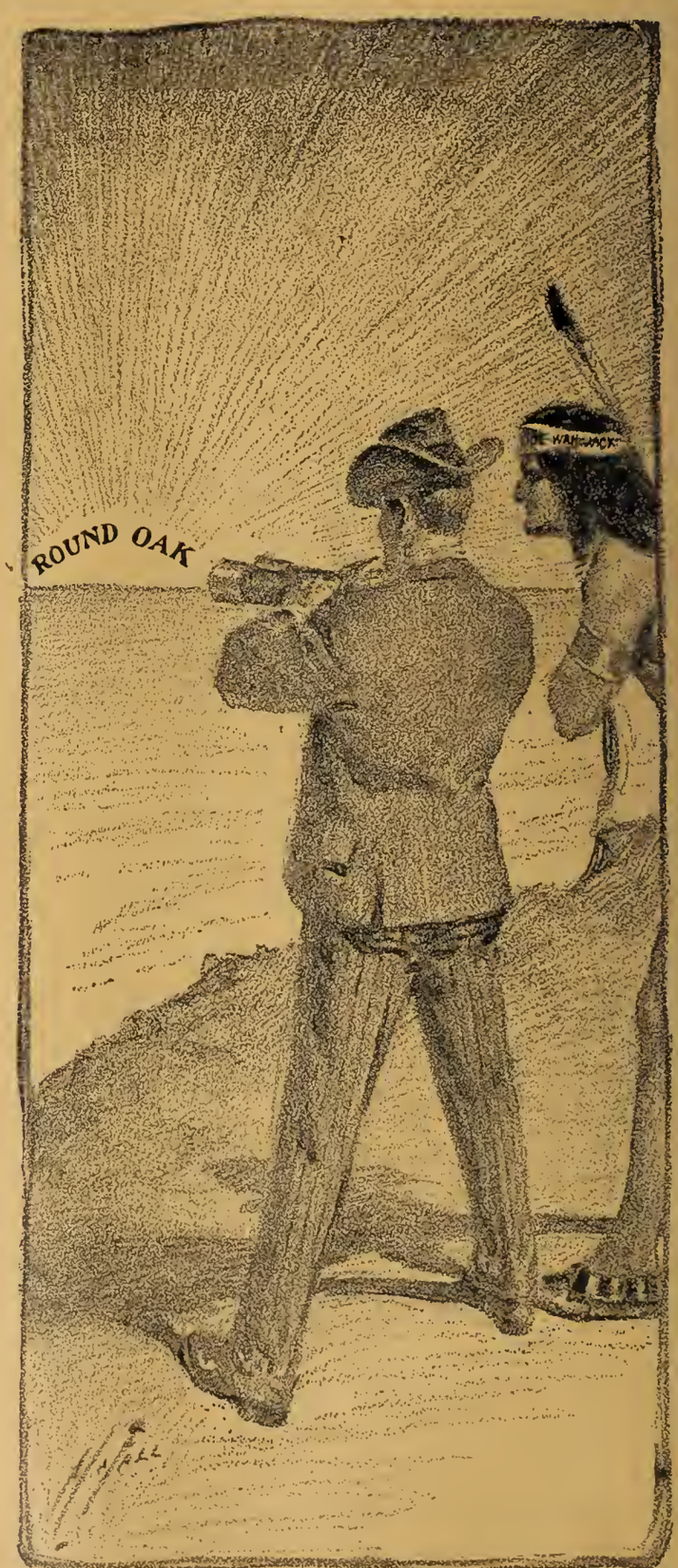
JENKINS BROS., New York, Boston, Chicago, Philadelphia.



ROUND OAK

STANDARD OF AMERICA

If you are looking for a Range to sell that is better fitted, more thoroughly insulated with asbestos board, that will hold fire, use less fuel for baking and cooking, that shows marked superiority in workmanship over any other construction in this country, the Round Oak Steel Range is the one you want. It will stand daylight; it will stand the most searching and rigid investigation. All our reputation and experience and capital have gone into making the best cooking apparatus that can be devised. Since this is so why not write us for catalogue and investigate?



Estate of

P. D. BECKWITH

Dowagiac

Mich.

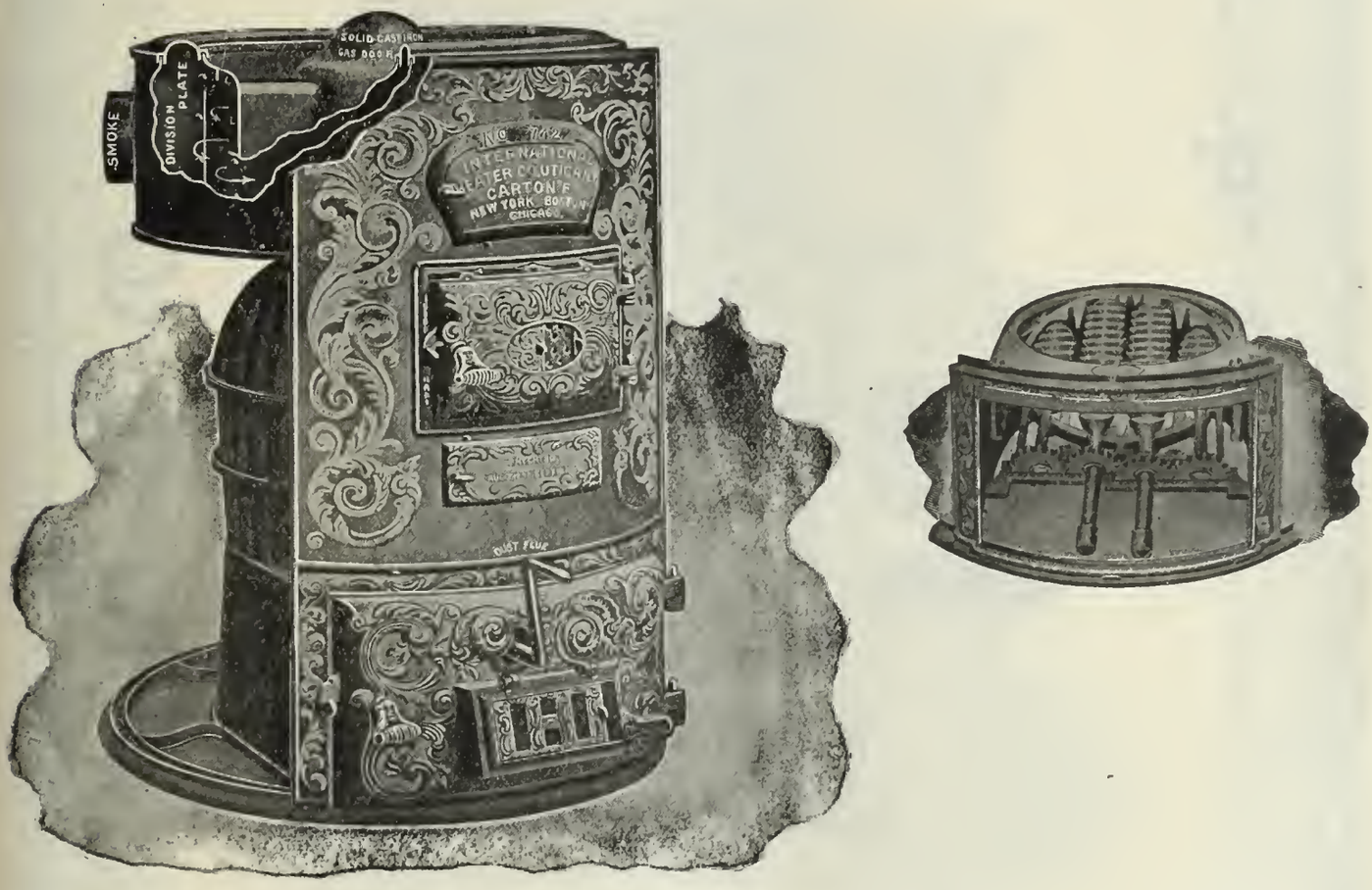
MAKERS OF GOOD GOODS ONLY

HB CHICAGO

CARTON FURNACES ARE TRADE MAGNETS. THEY WORK WELL, LAST WELL—GROW AT LENGTH INTO STANDING ADVERTISEMENTS.

CARTON "F"

WARM AIR FURNACE.



THIS HEATER PRESENTS DIRECT FIRE SURFACE IN SUPERABUNDANCE.

The Gas Dome, a one-piece casting, opens into the combustion chamber through a throat so wide that the fire current reaches clear to the top of the furnace in a single, unbroken, vigorous flow.

MODERATE IN PRICE;
THOROUGHLY EFFICIENT.

INTERNATIONAL HEATER CO., Utica, N. Y.

BOSTON, NEW YORK, CHICAGO, DENVER.

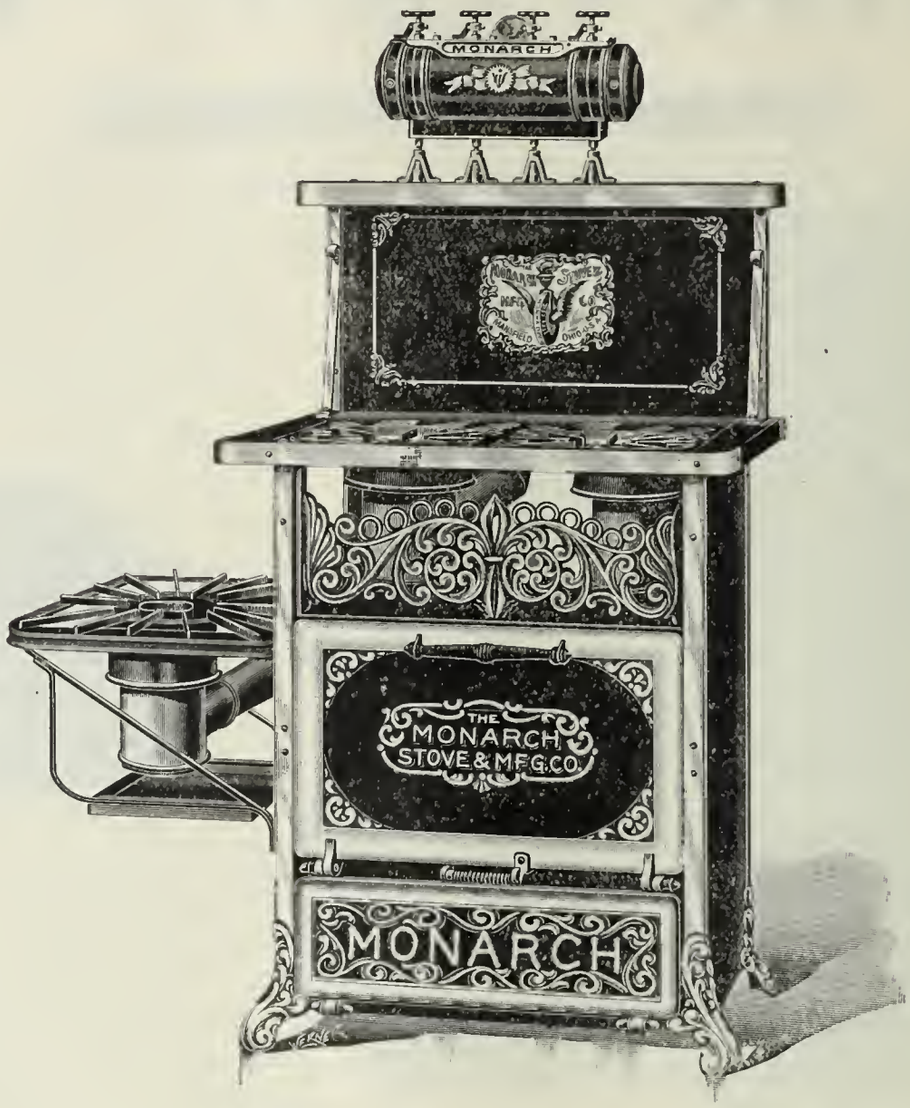
LARGEST MAKERS OF HEATERS IN THE WORLD

...THE...

MONARCH NEW METHOD

EVAPORATING GASOLENE STOVES.

FOR



1902

NOW READY FOR BUSINESS.

The Three Distinct Features on "MONARCH" goods are—

FIRST—Striking Originality and Distinctiveness of Features.

SECOND—Highest Grade Workmanship.

THIRD—Attractive and Artistic Design and Finish.

ANY ONE OF THESE THREE POINTS WILL PRODUCE PROFITS

THE MONARCH STOVE & MFG. CO., Mansfield, O.

—BRANCHES—

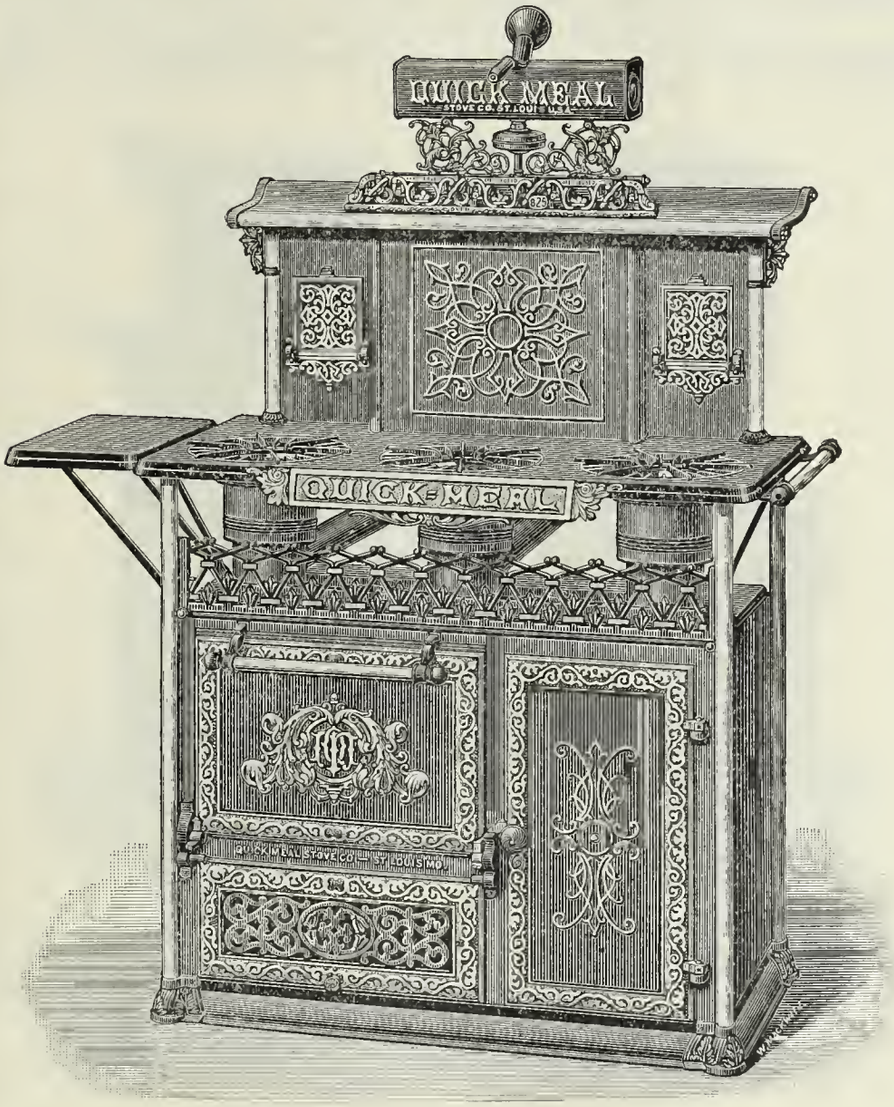
281-6 Pearl St., New York. 107 N. 2d St., Phila. 203 Wood St., Pittsburg 67 Lake St. Chicago. 191 Eagle St., St. Paul, Minn. H. R. Bruce & Co., Cincinnati, Ohio. Central Supply Co., Des Moines, Iowa. Newby Stove Repair Co, Kansas City, Mo Bartlett & Norris, Lincoln, Neb. W. H. Gruenhagen, St. Paul, Minn. M. F. Stellwagen, in Wisconsin. Kellogg & Stokes Stove Co., Denver, Colo. R. P. Smith, Houston, Texas.

The trade in the various States covered by these Branches and Representatives will be given the very best service possible and their interests receive the most careful attention.

Have you a copy of the Catalogue? If not drop a postal to any of the above and it will come on the jump.

QUICK MEAL

GASOLINE STOVES.



Quality is what makes and maintains a reputation.

Quality in material, design and workmanship is what has made the name "Quick Meal" famous all over the world.

Quality, combined with simplicity, is what has placed the "Quick Meal" Gasolines first in the eye of the dealer and first in the eye of the consumer.

Quality, together with special designs and distinct features of their own, is what places the dealer who handles the **"Quick Meal" Gasoline Stoves** in a position to command the best trade and make the most profit.

Quality and profit are necessary to protect a good name or build up a good reputation. "Quick Meal" Gasoline Stoves will make for the dealer both profit and reputation.

RINGEN STOVE Co. SAINT LOUIS

YOU CAN DEPEND ON IT.

The Standard Wickless Blue Flame Oil Stove,

FOR COAL OIL OR GASOLINE.

The original and most successful Wickless Oil Stove.



That's what it is—The "Standard."—Standard in name, the Standard in quality, the Standard in perfect operation. Four years of continued success and it still leads. It's the Standard of excellence.

Sold by the following jobbers:

EASTERN JOBBERS.

F. M. BORDEN & BRO., Philadelphia, Pa.

EUGENE MUNSELL & CO., New York, N. Y.

THE S. M. HOWES CO., Boston, Mass.

SOUTHERN JOBBERS.

W. B. BELKNAP & CO., Louisville, Ky.

THE NORTHWEST.

FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.

PACIFIC COAST STATES.

HOLBROOK, MERRILL & STETSON, San Francisco, Cal.

DOMINION OF CANADA.

THE THOS. DAVIDSON MFG. CO., · · Montreal, Quebec.

WESTERN JOBBERS.

COOK & VAN EVERA CO., Chicago, Ill.

MORLEY BROS. · Saginaw, Mich.

TOWNLEY STOVE CO., Terre Haute, Ind.

F. TIEMANN STOVE & HDWE. CO., St. Louis, Mo.

TOWNLEY METAL CO., Kansas City, Mo.

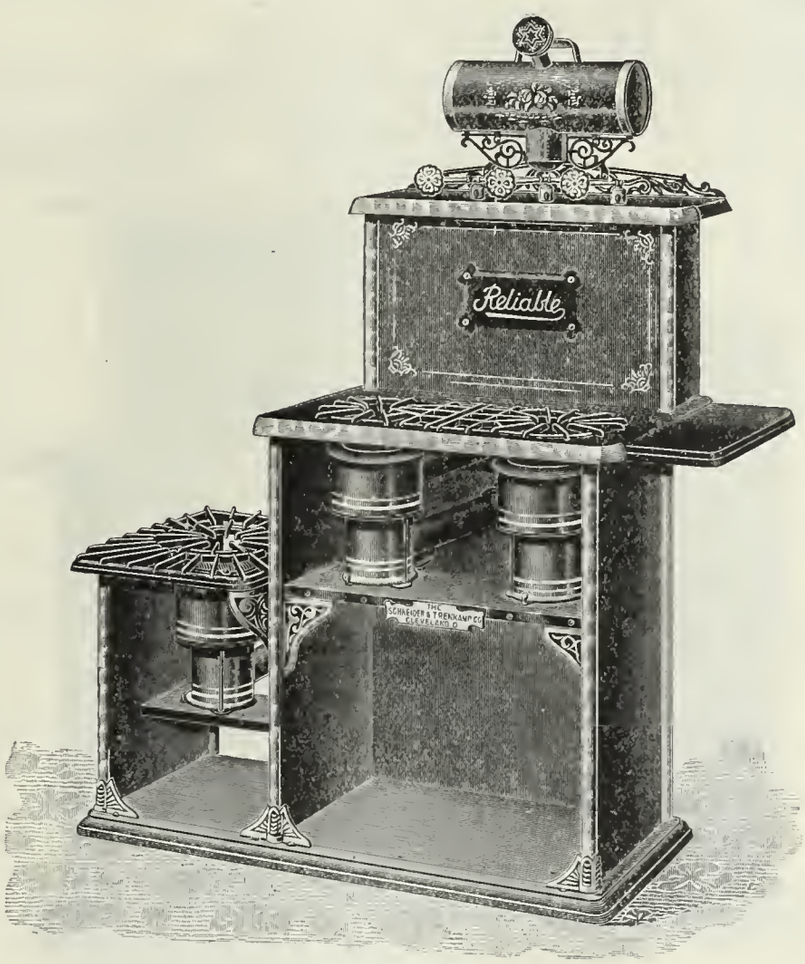
A. C. RAYMER, Omaha, Neb.

M. P. BORDEN STOVE CO., Denver, Col.

THE STANDARD LIGHTING CO., - Cleveland, Ohio.

Reliable Vapor Stoves and Ranges for 1902.

DEALERS who are seeking a strictly high grade line of Vapor Stoves and Ranges that are standard the country over cannot afford to overlook our line. "**RELIABLE**" Stoves have the NAME and FAME as being the best and most successful to handle.



THERE are NONE better. A few are claimed as good. None as well and favorably known. Our reputation will not permit of our making any inferior goods. If you wish to control the Vapor Stove business of your city, secure the agency of the "**RELIABLE.**" They have proved profitable and satisfactory to thousands in the past, and will to you.

Our line for 1902 is larger and finer than ever. Send for our latest catalogue. It is yours for the asking.

MADE BY

The Schneider & Trenkamp Company,

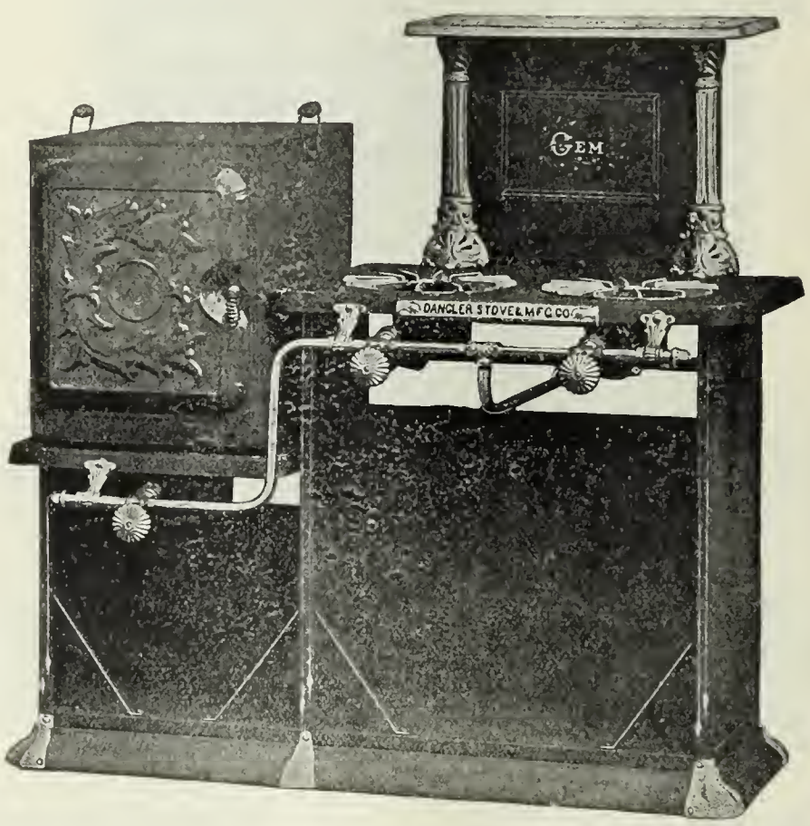
CLEVELAND. CHICAGO. SAN FRANCISCO.

THE DANGLER

For 1902 will put on the market a line of

Gasoline Vapor and Evaporating Stoves, Blue Flame Wick and Wickless Oil Stoves and also a line of Gas Ranges, Stoves, Hot Plates, etc. . . . . .

That for design, style and mechanical construction will not be equalled by any other make.



Our experience of 21 years in the manufacture of this line of goods,—being the oldest manufacturers,—justifies us in making the claim that our product has merits not found in other makes of Stoves in this line, notwithstanding that our lists, discounts and terms are the same as other manufacturers'.

All orders intrusted to us will have our careful and prompt attention. For further information we invite correspondence.

The Dangler Stove & Mfg. Co.,
Cleveland, Ohio, U. S. A.

JEWEL STOVES AND RANGES.

JEWEL STOVES AND RANGES
DETROIT STOVE WORKS
LARGEST STOVE PLANT IN THE WORLD

A Complete, Well Advertised Line; Low Prices and Good Workmanship.

Please Write for Catalogue.

DETROIT STOVE WORKS.

Detroit - Chicago.



NATIONAL STOVES

THE ONLY SAFE GASOLINE STOVE MADE.

LORAIN, OHIO, CHICAGO, 104 Lake St.

"Insurance"

SALES AGENTS.

EUGENE MUNSELL & CO., -	New York
F. M. BORDEN & BRO., - -	Philadelphia
PRESCOTT & CO., - - -	Boston, Mass.
BUTLER & JOHNSON, -	Syracuse, N. Y.
PACIFIC STOVE CO., - -	Los Angeles, Cal.
A. C. BARLER MFG. CO., -	Chicago, Ill.

HARPER & McINTIRE CO.

OTTUMWA, IOWA.

For IOWA, NEBRASKA. KANSAS, MISSOURI.

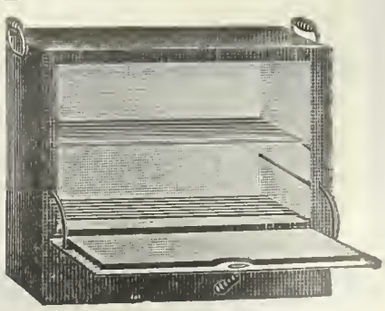
ACME LINE, 1902.

Asbestos Lined Ranges and Ovens, Cookers and Hot Plates.

FOR ALL GASES.



Catalog No. 35 on application.

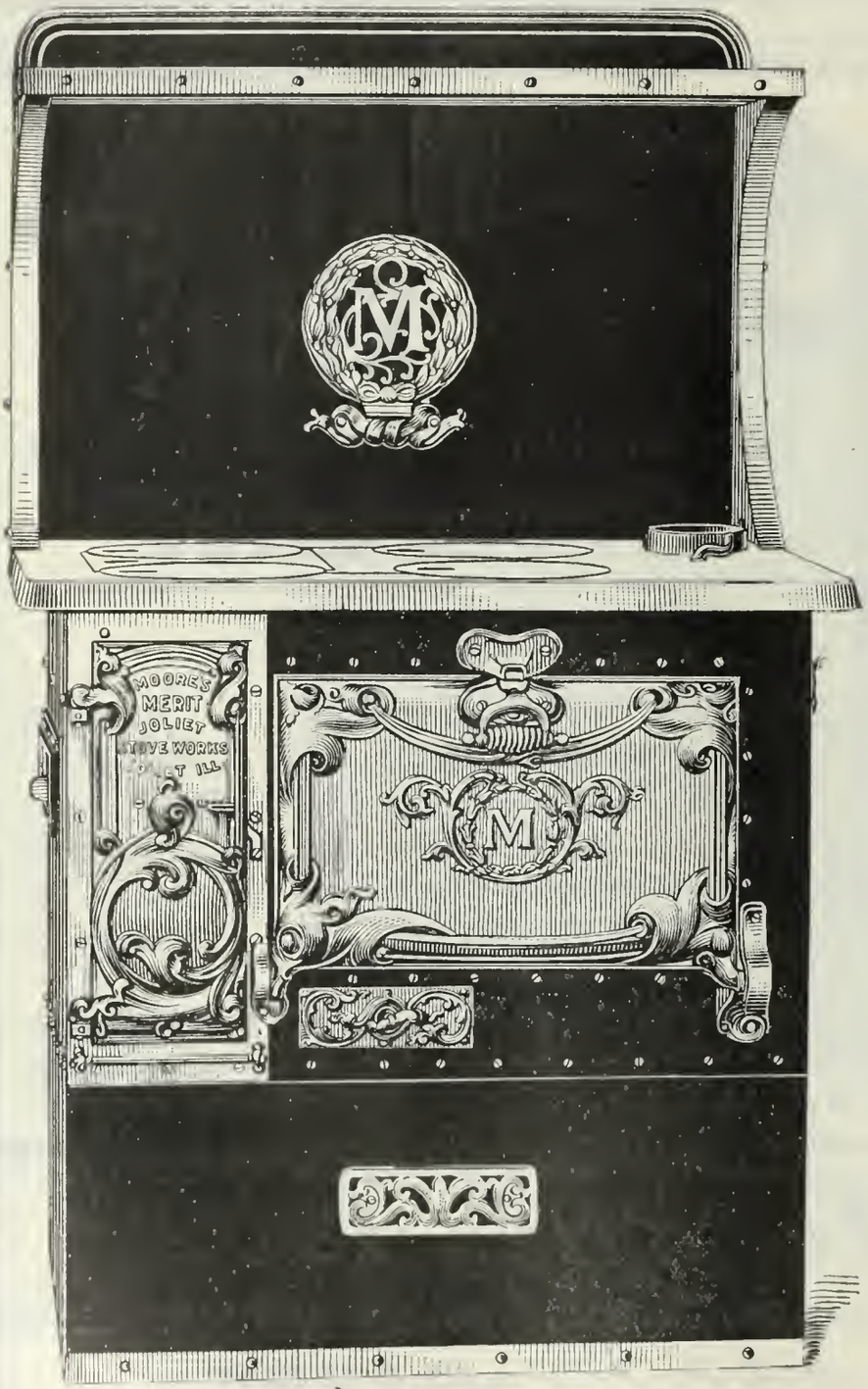


H. ADLER CO.,

PITTSBURG, PA.

HENRY WATERMAN, - - 195 Lewis St., N. Y., Eastern Agent.

Moore's STOVES & RANGES



A Complete Range

At the Price of an Ordinary Cook Stove

Moore's Merit is thoroughly made—perfect in operation and is just the thing for your customers with limited pocket books.

JOLIET STOVE WORKS, Joliet, Illinois.

35

This is not a

Jewel Gasolene Steel Range

IT IS THE SENSATIONAL

Steel Gas Range

BROUGHT OUT LAST YEAR BY

GEORGE M. CLARK AND COMPANY.



They Cannot Break It.
Aggregate Weight, 1009 pounds.

Stood Every Test.
Thousands Were Sold
Every Record Broken.
Each One Sold Others.
Less Costly than Cast Iron.

This Range made with step in

FOUR STYLES FOR GASOLENE

is our

Leader for 1902.

Gas Companies who had no faith in Steel Ranges till ours was tried, are buying them by the car load. We predict the same success for the GASOLENE Range.

WRITE FOR CATALOG.

GEORGE M. CLARK AND COMPANY,

73 LAKE STREET, CHICAGO.

OUR

CATALOGUE,

SHOWING

GAS RANGES
CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS

WILL BE FURNISHED FOR THE ASKING BY

Enterprise Stove Co., VINCENNES, IND.

WROUGHT STEEL

RANGES

LIKE THE

"PACIFIC"

Are best because they're made stronger, better, more perfect than any other similar construction. You should write for prices and secure our Catalogue.

It is made with High Closet, Rolling Front, Six Holes, for Hard or Soft Coal; is the latest, best and handsomest Steel Range ever offered, one that you can offer as simply "out of sight" compared with that sold by the peddlers. Try it.



...THE...

JOHN VAN RANGE CO.,

Warerooms:—419 ELM ST.,

Factories:—6-8-10 and 12 HOME ST.,

CINCINNATI, O.

IF YOU ARE NOT SELLING THE

Peck-Williamson Underfeed Furnace



you have not the trade and are not making the money you might. Just a pull or two of the lever feeds the new coal from underneath.

The Underfeed Furnace consumes less fuel than any other furnace ever built. The coal is burnt more slowly. All the heat units from it, as well as from the smoke, are utilized and all smoke eliminated.

Our handsome booklet explains its splendid heating qualities and coal saving.

You may have this booklet and our special plans for selling. Ask for booklet about our Laundry Dryer also.



THE PECK-WILLIAMSON COMPANY,

CINCINNATI, OHIO.

THE H.B.SMITH CO.,
WESTFIELD, MASS., U.S.A.

Catalogue furnished only upon application to

Heating Contractors, Engineers and Architects

64 Pages. Size 9 x 12 Inches.

INDIRECT RADIATORS

(16 STYLES)

PACIFIC COAST AGENTS

HOLBROOK, MERRILL & STETSON,
SAN FRANCISCO, CAL.

EUROPEAN AGENTS

AUG. EGGERS,
BREMEN AND NEW YORK CITY.

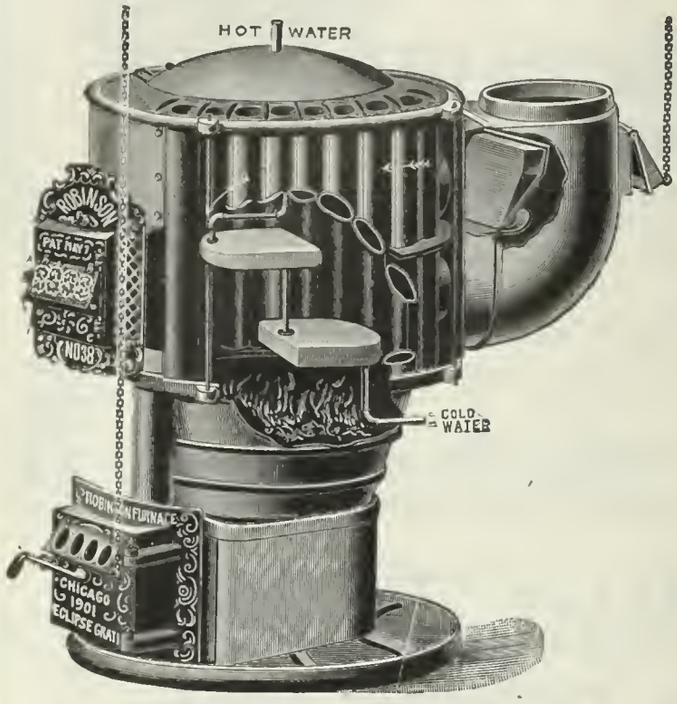
SALESROOMS:

THE H.B.SMITH CO.,

133 CENTRE STREET,
NEW YORK.

510 ARCH STREET,
PHILADELPHIA.

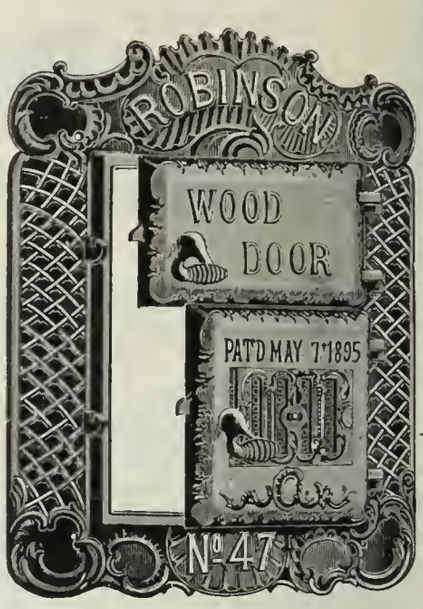
The Robinson Tubular Warm Air Furnaces



Robinson Tubular Furnace for Hard Coal.

are constructed to give the greatest amount of heat from the smallest amount of fuel. These furnaces contain many special features not found in other heaters. These features are original with us and are fully protected by letters patent.

Write for catalogue.



Double Doors on Robinson} Tubular Furnace.

ROBINSON FURNACE CO., - Chicago, Ill.

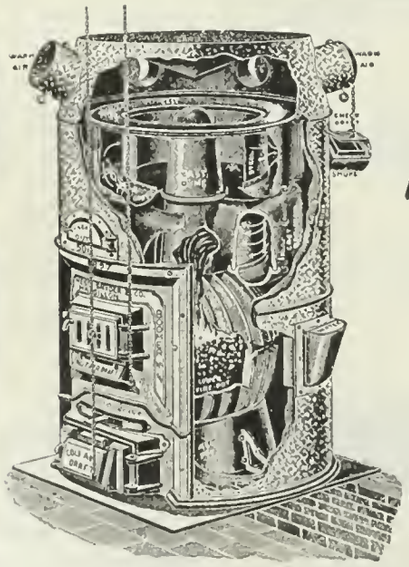
Boiler Copyright '99.

REGARDING

Boomer Furnaces.

OR

Boomer Steel Ranges

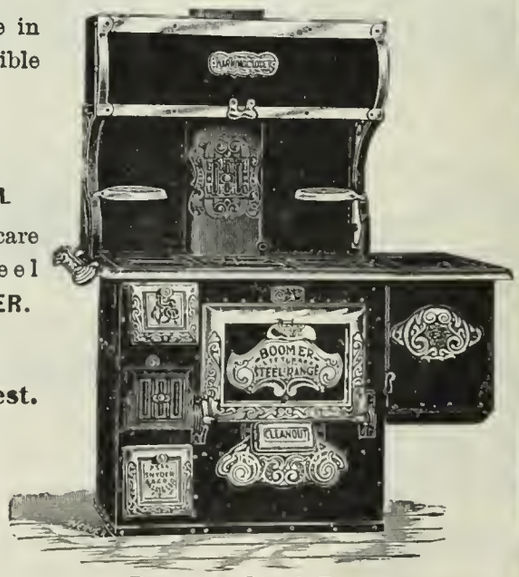


Boomer Furnace.

We want to state in strongest terms possible that if you want the

HEAVIEST,
MOST DURABLE,
MOST ECONOMICAL

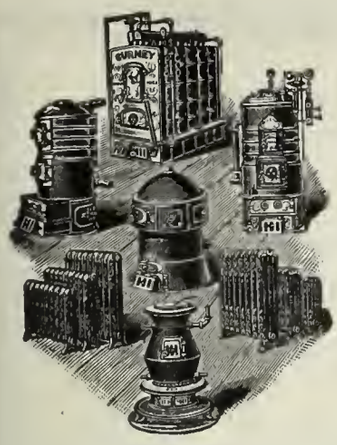
and easiest to take care of Furnace or Steel Range, buy a **BOOMER.**



Boomer Steel Range.

Neither time nor money is spared to make them the Best.
Buy Boomers and save your coal bills.
We invite investigation.

THE HESS-SNYDER CO.,
Manufacturers, MASSILLON, O.



Gurney Heaters

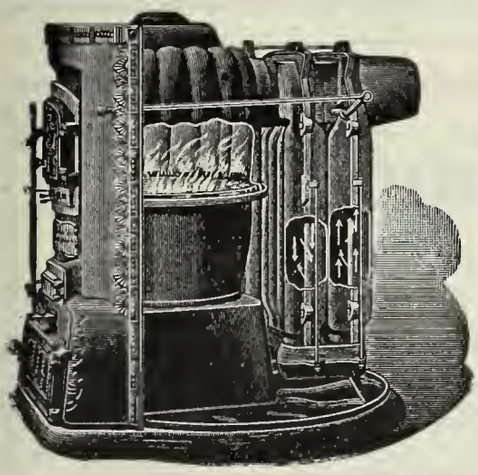
Provide every advantage a heater can provide,—the very best material, the most durable and approved construction, insuring the greatest efficiency from the least possible consumption of fuel.

CAPACITIES FULLY GUARANTEED.

Don't you wish to handle the BEST? Send for our latest trade catalogue.

GURNEY HEATER MFG. CO., 74 Franklin Street, Boston. 111 Fifth Ave., New York City.

Western Selling Agents, JAMES B. CLOW & SONS, 222-224 Lake St., Chicago, Ills.



Bengal Furnaces.

EASY TO SELL. SURE TO PLEASE.

LEADERS OF THEIR CLASS.

3,500 square feet of radiating surface—more than any other furnace their SIZE.

ALL CAST IRON.

Secure a BENGAL AGENCY at once.

CATALOGUE ON APPLICATION

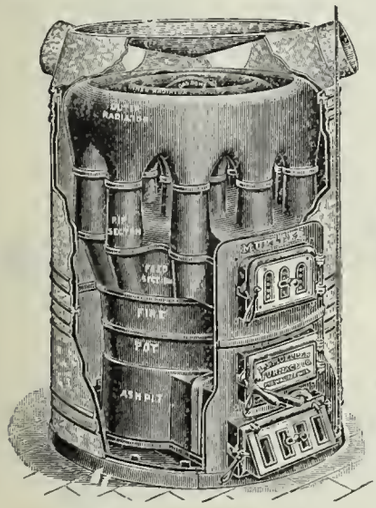
EASTERN SELLING AGENTS:

GURNEY & CO.,

Washington, Hanover and Elm Streets, Boston, Mass.

FLOYD, WELLS & CO., Royersford, Pa.

All Cast Iron Double Radiator.



Quality First

IS THE PRINCIPLE FOLLOWED

In the Manufacture of

MUELLER

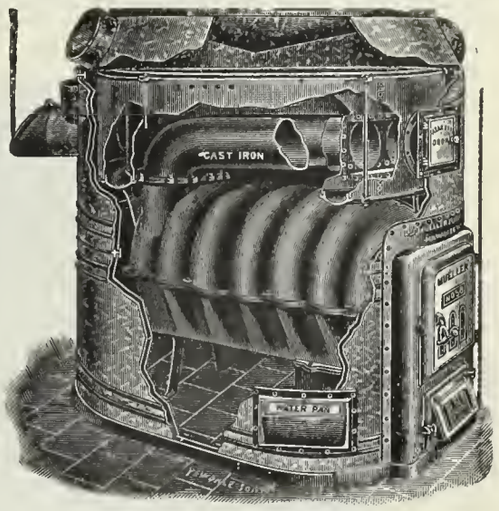
Furnaces and Boilers.

Made in all Styles—For all Kinds of Fuel.

Get Our Special Register Offer.

EVERYTHING IN THE HEATING LINE.

FOR WOOD.



190 Reed St., L. J. MUELLER FURNACE CO., Milwaukee, Wis.

BRAND STOVE CO.

STOVES, RANGES and FURNACES.

SEND FOR CATALOG.

MILWAUKEE, WIS.

It isn't the amount of money you pay for a furnace that insures results, but the real value of the article itself determined by your customer, who compares its economy in fuel and heating capacity with some other furnace he has used before

The manufacturer who doesn't get one good, enduring "kick" on at least one out of every hundred furnaces sold, is either very lucky or has an exceptionally good article.

In **Not One Single Instance** have we ever received complaint as to a **"DIGHTON"** using too much coal.

In some instances we have made special low prices to introduce it where it has never been sold before.

After a thorough trial, the first customer becomes a strong supporter of the **"DIGHTON"** and we never hesitate about referring any inquirer to him, no matter whether he has advised us as to whether it has been satisfactory or not.

In over 30 years' experience in making and selling furnaces we have never put one on the market that warranted greater economy and satisfactory service to the user.

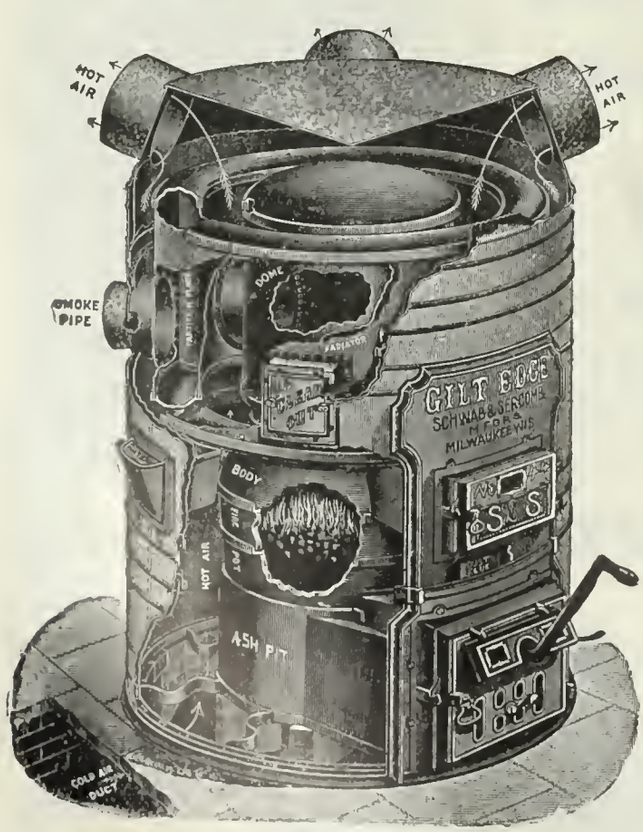
DIGHTON FURNACE CO., = Taunton, Mass.

Your Guarantee is Good,

If backed up by our line. We make many kinds and sizes of steam and hot water boilers, and you as a dealer ought to know all about this line. Let us send you our printed matter and post you on the standard line. Write to-day.

KEWANEE BOILER COMPANY

KEWANEE, ILLS.



Gilt Edge Warm Air

AND

Combination Heaters

have merits that are all their own. They are made in a large variety of styles and sizes, each adapted especially to a certain class of fuel. We are manufacturers of a complete line of Warm Air Registers, Safety Pipe and Tin Galvanized Iron Furnace Fittings.

R. J. SCHWAB & SONS CO.,

MILWAUKEE, WIS.

Royal Heaters.

HART & CROUSE CO.,

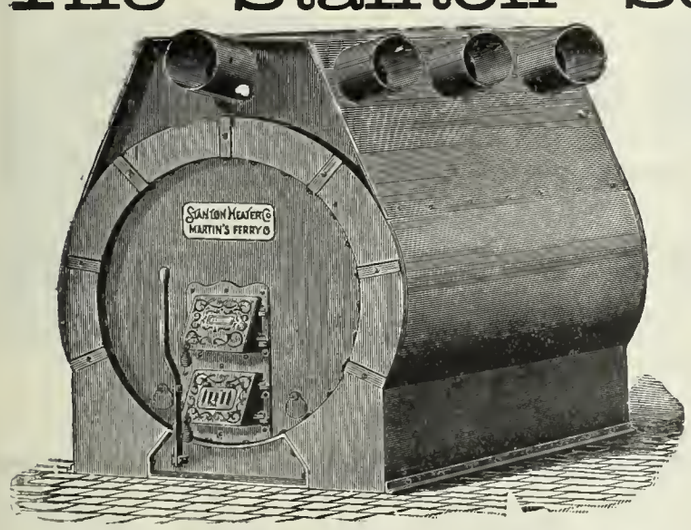
UTICA, N. Y.

The Leading Line of Heating Apparatus.

HOT WATER,
STEAM,
HOT AIR.

The Stanton Seamless Heater,

PORTABLE CASED.



CADIZ, OHIO, June 18th, 1900.

GENTLEMEN:—We had a Stanton Furnace No. 84 put in last Fall and have nothing but praise to say of it. The space heated is 50,400 cubic feet, which it keeps comfortable in the coldest weather. Our fuel costs only one-fourth what it used to and besides is perfectly clean. We take pleasure in recommending it. Respectfully,

J. EHRHART, Hotel Ehrhart.

SEND FOR CATALOGUE.

THE STANTON HEATER CO.,

Martin's Ferry, Ohio.

See Our Advertisement Next Week.



Emperor Furnaces

FOR WOOD.

Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces. . . .
Furnished for either Brick or Galvanized Iron Casing

SEND FOR CATALOGUE.

Bergstrom Bros Co.

NEENAH, WIS.

They regulate heat in residences, offices, stores, mfg. plants. Guaranteed.

The Howard Thermostat Co.

West Water Street, Oswego, N. Y.

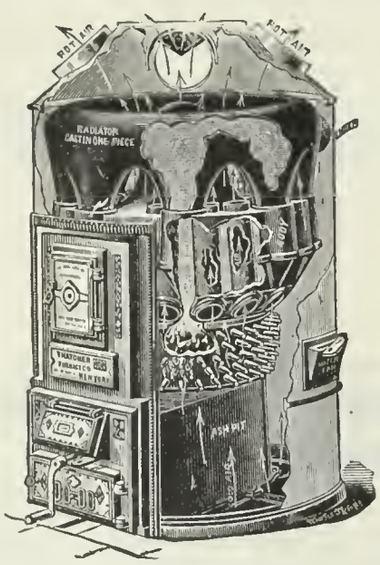
No electricity or compressed air. Simple as a heavy spring motor can be.

Would like to send you their catalogue and give a few reasons why you should sell their Heat, Valve, Draft and Damper Regulators. This should be an interesting topic. We have the most simple thermostat made; also the most sensitive. Only three parts—a sensitive and powerful sensitive plate, a heavy spring motor made of brass, and common pulley connections. Just enough material to do the work satisfactorily, but not one atom too much. They do "straight work," without the aid of outside agencies. No other thermostat on the market can do more with all of its electricity and compressed air connections.

THEY SAVE THE COAL

WHICH IS WASTED BY THE WRONG OPERATION OF FURNACE OR BOILER DAMPERS.

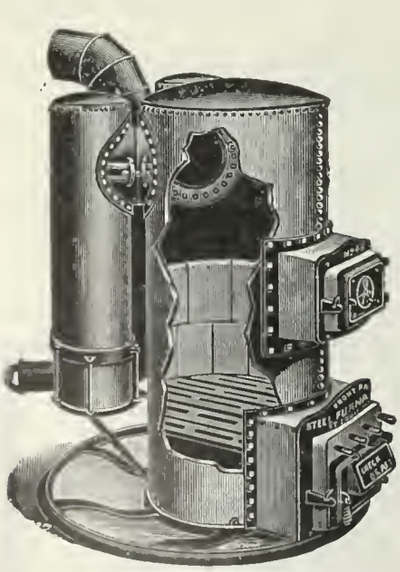
A Combination



OF excellent workmanship, durability of construction, economy of operation and an intelligent and scientific application of the sanitary principles involved in modern warm air heating conspire to place the Thatcher Furnace at the head of this class of heaters.

WRITE FOR CATALOGUE.

Thatcher Furnace Co., WARM AIR FURNACES, RANGES, STEAM AND HOT WATER HEATERS. 240 Water St. N. Y. WORKS, Newark, N. J.



A FEW POINTS OF SUPERIORITY

Fire pots are of fire clay tiling and never burn out.
Radiator surface in proportion to grate surface unusually large.
Only absolutely gas tight furnace made.
Novelty of construction makes an easy seller.
Tested for fifteen years.

Repairs are seldom necessary.
Are guaranteed to burn hard or soft coal.
No direct draft to warp out of shape, nor packed joints to leak gas.
Katalogue and prices will be mailed you upon application.

FRONT RANK STEEL FURNACE CO., 2301 to 2309 Lucas Ave., St. Louis, Mo.

Gurney

HOT WATER GENERATORS
HOT AIR GENERATORS
STEAM GENERATORS
RANGES *and* STOVES
REFRIGERATORS
STEEL RANGES
GAS RANGES
FURNACES

GURNEY AND COMPANY
WASHINGTON, HANOVER AND ELM STREETS
BOSTON, - MASSACHUSETTS

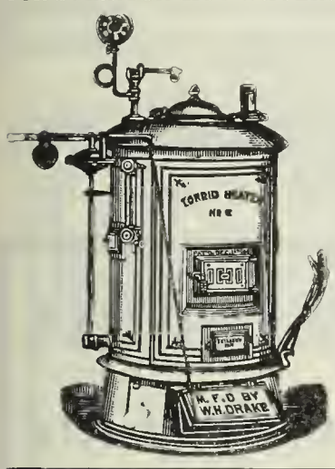
STAMFORD FOUNDRY COMPANY

MAKERS OF

RANGES COOKING AND HEATING STOVES
HOT-AIR AND COMBINATION AIR AND
WATER FURNACES
LAUNDRY STOVES CONFECTIONERS' STOVES
CABOOSE RANGES ETC ETC

STAMFORD CONN

"TORRID HEATER."
FOR STEAM OR HOT WATER.



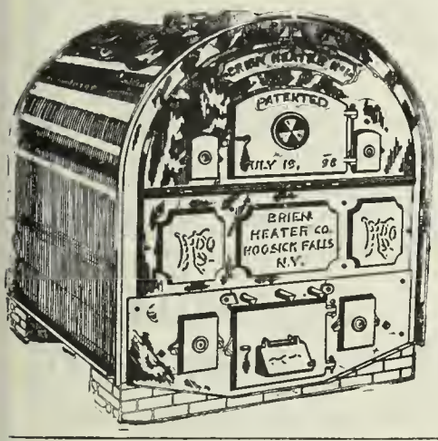
It is Practical in Design.
It is Safe, Being Tested to 200 Pounds.
It is Easy to Manage and Keep Clean.
It is Durable.
It is Sectional and Easily Handled.
It has No Packed Joints.
It is Self-Feed or Surface Burning.
It has the Torrid Patent Rocking and Dumping Grate.
It is Low in Price.

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MANUFACTURED BY

W. H. DRAKE, No. 36 Clinton St., NEWARK, N. J.

Factory: Hackettstown, N. J.



Brien Heater.

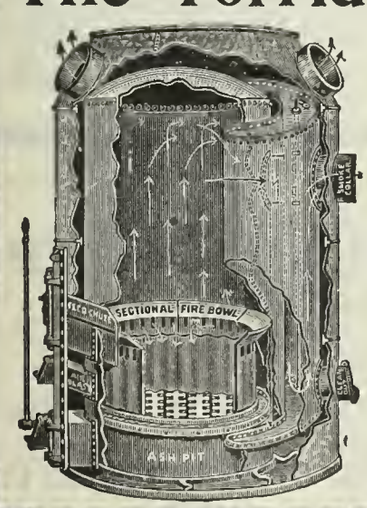
A perfect, all cast WOOD or COAL burner. There is no other Hot Air Furnace as low down as the "BRIEN"

Write for territory, catalog and prices.

BRIEN HEATER CO.,

HOOSICK FALLS, N. Y.

The Torrid Zone Furnace



is a trade winner because it has points of merit peculiar to itself that can be found in no other steel furnace. Our new catalogue is now ready to mail and a description of our Hot Air and Hot Water Combination Furnace can be seen in it. We furnish either the cast iron lining or the fire brick at the same price. Our Wood Furnace is called a powerful heater by those who use it.

CATALOGUE FREE.

Lennox Manufacturing Company,

Eighth Ave. and Frederick St.,
MARSHALLTOWN, IOWA.

HOT WATER AND HOT AIR

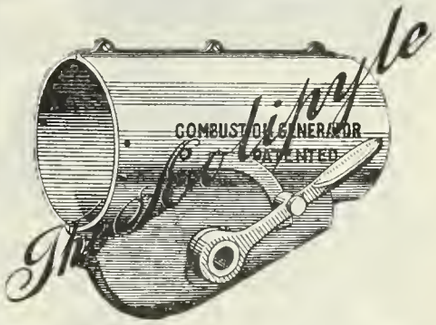


HEATING BY COMBINATION STOVES AND FURNACES.

Suitable for Large or Small Houses, Stores, Conservatories, Barber Shops, Hotels, etc., etc.

Heat Water Quickly.
Circulation is Positive.
No Joints Inside to Leak.

THE NATIONAL PIPE BENDING CO
160 RIVER ST., NEW HAVEN, CONN.



Saves Coal, Increases Heat,
Keeps Temperature Even,
Prevents Escape of Coal Gas,
Reduces Labor,
Avoids Sifting Ashes,

When Applied for Domestic Use to Smoke Pipe of

House Furnace,
Hot Water Heater,
Low Pressure Boiler,
Stove or Range.

Æolipyle Company,

237 Water St., New York,

Tel. 1849, John. U. S. A.

SCRANTON CORUNDUM & EMERY WHEEL CO,

1311-1315 Capouse Avenue, SCRANTON, PA.

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OUR "BLACK DIAMOND" artificial abrasive wheels are especially adapted for The Stove Trade

THEY ARE THE BEST.

Pierce

BOILERS and RADIATORS

for Steam and Water Heating.



Pierce Touraine Steam Boiler.

LARGE HEATING CAPACITY.
ECONOMIC IN FUEL CONSUMPTION.

Endorsed by the foremost Architects and Heating Engineers.

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Pierce, Butler & Pierce Mfg. Co.,
Syracuse, N. Y.
New York. Boston. Philadelphia.

The Champion Hot Water Combination Boilers.



They Fit Any Furnace.

Base section when used without ring sections.

Ring Section.

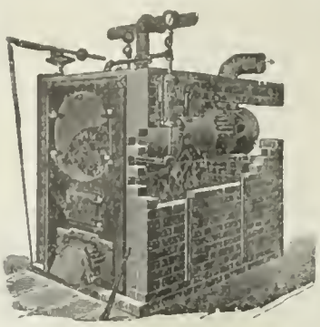
These Boilers are made in three sizes diameter, and from 100 to 600 square feet radiation capacity.
Will heat those cold rooms, or an addition to the building. Will increase the capacity of any furnace. Are cheaper than coils and will do more work.
Write for new circular. Manufactured by

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WE don't expect you to buy Independent Registers unless it is to your advantage. But let us quote our prices.

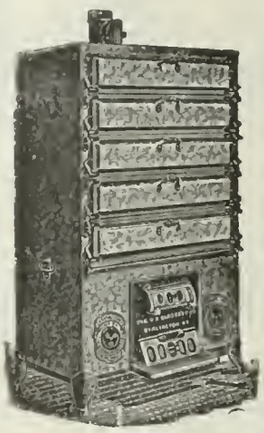
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CLEVELAND, O.



Vance Boilers.

The most economical Steam and Hot Water Boiler on the market. Write for Catalogue and Price List.

VANCE BOILER WORKS,
373 Atkinson St., Geneva, N. Y.



CABINET PORTABLE OVEN.

OUR LATEST PRODUCTION.

BAKES EVENLY BY THE CIRCULATION OF HOT AIR.

FOR BAKERS, CONFECTIONERS, HOTELS,

Also the best oven for Core Baking, Japanning, Enamelling, etc.

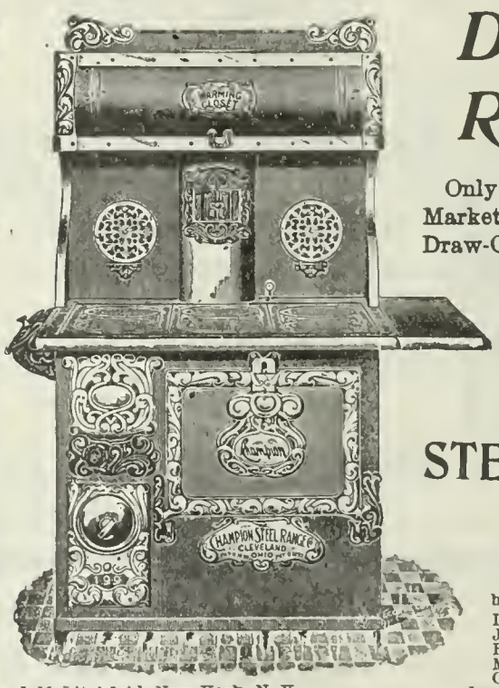
Made in six sizes, single and double, for coal, wood, natural or artificial gas.

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Champion and Marquart

Double Flue Ranges.



Only Double Flue Ranges in the Market. The Greatest Fuel Saver. Draw-Out Grate.

Handsomely Finished Throughout. Prices Within Reach of all.

CHAMPION STEEL RANGE CO.,
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We are represented by the following houses:

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20th Century Gas Stoves

THE BEST GAS STOVE MADE.

Best Materials and Workmanship. Prices Low. Mail Orders Promptly Filled.

STOVE REPAIRS IN STOCK
FOR 2,000 STOVES AND RANGES.

Write for Prices.

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261-261½ Springfield Ave., Newark, N. J.



WINCHESTER

A man is attracted often by the looks of a heater or the looks of a salesman, and buys a sample. It's his last purchase of that kind. It needs substance to retain his business and secure duplicate orders, and that substance is found in the "WINCHESTER" Steam or Water Heaters. For agency write Smith & Thayer Company, Boston, Mass., 106 Beekman St., New York.

HEATER.



Refrigerators, Blue Flame Oil Stoves, Gasoline Stoves.

LARGEST JOBBERS in NEW ENGLAND.

Gas Ranges, Furnaces, Stoves, Ranges and Repairs.

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AS GOOD AS GOLD IS A

RICHMOND HEATER.

IT CUTS YOUR COAL BILL IN TWO.
IT WARMS YOUR HOUSE FROM CELLAR TO GARRET, AND ALMOST TAKES CARE OF ITSELF.

Write for Catalogue,

The Richmond Stove Co.
NORWICH, CONN.

Stove Dealers

will make money and save money by using

Dixon's Graphite Cement.

There is nothing equal to it for repairing fire brick in stoves, furnaces, etc. Let us send you sample and prices.

JOSEPH DIXON CRUCIBLE CO., - JERSEY CITY, N. J.

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EUGENE MUNSELL & CO.
MINERS & IMPORTERS.
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The "A B C" Blast Gates.



Simple, Effective,
For closing pipes in exhaust, blast and heating systems.
Send for price list.

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Detroit, Mich.
New York. Chicago. London.

We Protect Dealers

WHO HANDLE BURTON'S



FUEL ECONOMIZER.

Give us a trial order.

W. J. BURTON & CO.,
164-166 W. Larned Street, Detroit.

SELECTED MICA

. . . ONLY . . .

Prepared expressly for the Stove and Hardware Trade.

Two Grades: "North Carolina" and "Nevada."

PRICE LISTS AND DISCOUNTS SENT ON APPLICATION.

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115 Beekman St., New York.

PATTERNS

FOR STOVES AND HEATERS.

First-class in wood and iron.

Vedder Pattern Works, - Troy, N. Y.

MICA

Specially Prepared for the Stove Trade.

OHIO MICA CO., CANTON, OHIO.

THE GEORGE W. COPE Stove Pattern Works.

ORIGINAL, ARTISTIC AND PRACTICAL CONSTRUCTION.

Cor. Randolph and Atwater Sts.,
DETROIT, : : MICH.

FOR **MICA**

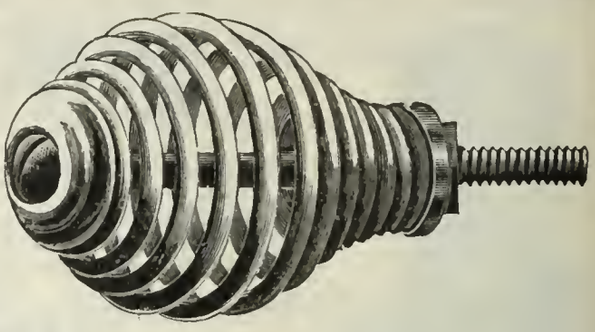
Sheet, out or uncut, Powdered and Flake,

WRITE TO

ASHEVILLE MICA CO.,
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TROY NICKEL WORKS,

ALBANY, - NEW YORK.

ESTABLISHED 1880.



All The Latest Novelties in Stove Trimmings.

ALWAYS COLD.

If you want your stoves up-to-date you must use
Alaska Stove Trimmings.

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Who sells cheap goods at cheap prices cannot expect to enjoy his share of the general prosperity of the country.

Standard goods at moderate prices is the correct motto.



RUTLAND FIRE CLAY CO.,

60 Wabash Ave.,
CHICAGO, ILL.

NORTH EAST, MD.

Rutland, Vt.



"O.H." ONE PIECE STOVE PIPE Elbows

Perfectly round and true to size. With long ends, DOUBLE LOCK SEAM in throat or under side of Elbow.

HANDSOMEST, HEAVIEST AND STRONGEST STOVE PIPE ELBOW MANUFACTURED.

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THE LAWRENCE-LETTS ELBOW CO., Ltd., - - Waverly, N. Y.

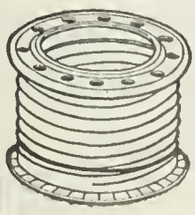
The Milwaukee Pattern Works.

Ornamental and Stove Patterns.

Sketches and Designs for Stove Work of all kinds.

Correspondence Solicited.

506-507 Cedar Street, MILWAUKEE, WIS.

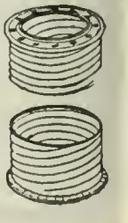


O. K. STOVE PIPE THIMBLE

FOR PARTITIONS AND CEILINGS.

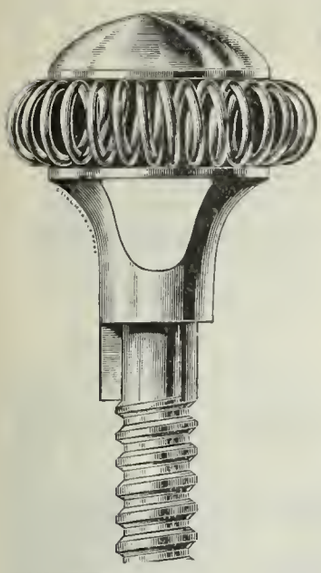
Can easily be adjusted to any thickness of wall, and when screwed up tight against plaster will not work loose and allow the plaster to crumble and fall.

It is perfectly fire-proof, low in price and never fails to interest customers.



O. K. MANUFACTURING CO.,

Division Street, - - BUFFALO, N. Y.



No. 346 Draft Register.

No. 520 ZERO Screw Knob.

MANUFACTURED BY

W. H SHIELDS & CO.,

Successors to W. F. GREENE.

TROY, = = N. Y.



MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

RANGE, STOVE AND HEATER REPAIRS

AND FIRE-BRICK LININGS.

74 Beekman Street, New York,

FOUNDRY, Perth Amboy, N. J.

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For all Stoves, Ranges and Heaters.

PRESBREY STOVE LINING CO.,

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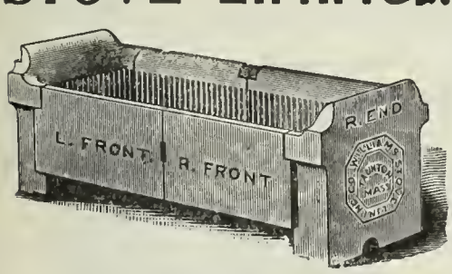
M. D. VALENTINE & BRO CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBRIDGE. N. J.

BRICK STOVE LININGS.



Eagle Stove Clay.

Incandescent Gas Fuel.

WILLIAMS STOVE LINING CO.,

TAUNTON, MASS.

SHINES FOR ALL

It is the polishers' friend, and will polish anything. Write for free sample to 297 E. Washington St., Ind'p'l's, Ind.



GEO W. HOFFMAN



DO you want Stoves and Heaters that are easily sold and *STAY SOLD?* We have been very successful in designing patterns for such.

THE GOBEILLE PATTERN CO.,

CLEVELAND, OHIO

HANDLE THE BEST:

CHAMPION STOVE CLAY

Is the only brand made of crucible materials, viz.: Imported German Fire Clay and Plumbago from Ceylon.



Dealers are invited to send for circulars.

Packed in neat, attractive, round pasteboard boxes of three sizes: large, medium and small, holding about 10 lbs., 6 lbs. and 2½ lbs., respectively.

ALSO SOLD IN BULK.

Your jobber can furnish the goods.

BRIDGEPORT CRUCIBLE CO.

Bridgeport, Conn.

STOVE BANDS
—AND—
RINGS.

SPECIAL TUBING.
Cut to Length and Plated.
FLAT STRIPS & CORNERS.
SPECIAL
PUNCH
PRESSWORK
SOLICITED.
Quality and Finish the Best.
The Kirk Manufacturing Co.,
TOLEDO, - - - OHIO.

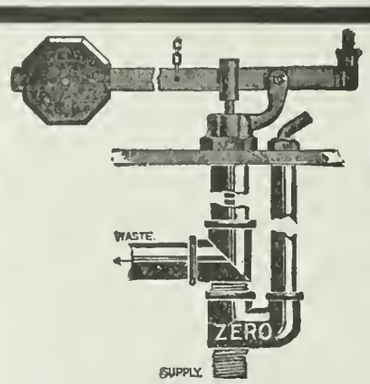
The No. 1 FIRE POT



$6.00 NET.

has stood at the head of our line **for fourteen years,** and is to-day leading all other makes, making new friends everywhere, saving the user its cost in the saving of gasoline alone, and having many advantages which make it **the acknowledged King of Fire Pots.** Are you using the No. 1? Our catalog is free. **It's worth dollars to you** and tells all about Fire Pots and To ches.

CLAYTON & LAMBERT MFG. CO.,
DETROIT, MICH., U. S. A.



SAVE HALF

The expense of installing closets by getting

Zero Anti-Freezing Valves.

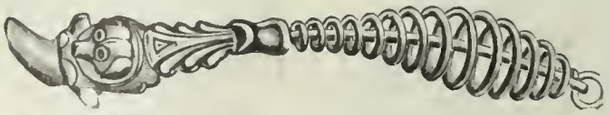
They can be put in with half the time and half the labor because they do not require a pit or vault.

They are simple and durable in construction—made without screws, springs or pins.

Zero Valve & Brass Mfg. Co.,
296 Seneca St., Buffalo, N. Y.

JOHN H. LAWLESS,
Plumbers' Force Pumps,
84-186 Third St., Jersey City, N. J.
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Stove Pokers and Lifters.



"Siberian Lifter."
Fancy design, nickel plated body malleable iron.

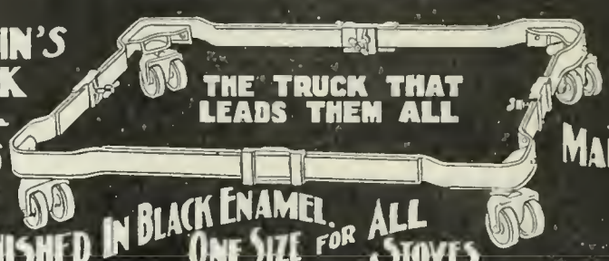
"SIBERIAN" POKER.
Either bent or straight ends; length, 20 in.



Manufacturers of HARDWARE SPECIALTIES.
WRITE US FOR PRICES.
ARCADE MANUFACTURING CO., - FREEPORT, ILL.

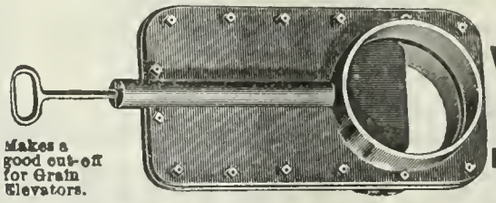
THE DAISY ADJUSTABLE STOVE TRUCK

MARTIN'S TRUCK CASTERS



STEEL FRAME MALLEABLE IRON FITTINGS.

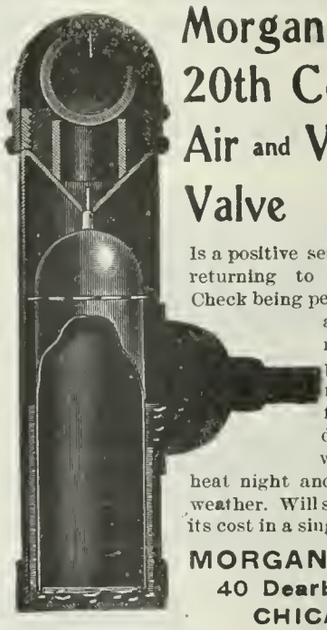
FINISHED IN BLACK ENAMEL. ONE SIZE FOR ALL STOVES.
TUCKER & DORSEY MFG. CO. INDIANAPOLIS IND.



Makes a good cut-off for Grain Elevators.

IMPROVED WIND-GATE

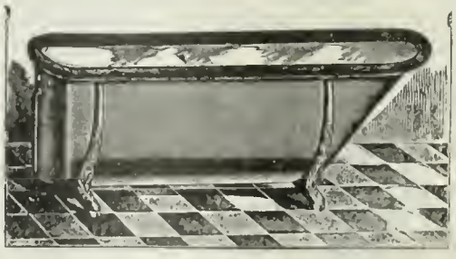
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NEW HAVEN, CONN.



Morgan's 20th Century Air and Vacuum Valve

Is a positive seal against air returning to the radiator. Check being perpetually balanced in water requires no pressure to lift it. A banked fire, with drafts closed, will maintain heat night and day in mild weather. Will save four times its cost in a single season.

MORGAN & CO.,
40 Dearborn St.,
CHICAGO.



Day Metallic Manufacturing Co.,

DETROIT, MICHIGAN,

Manufacturers of

Steel Enamel and Steel Clad
BATH TUBS and HEATERS.

NOTHING SUCCEEDS LIKE SUCCESS,

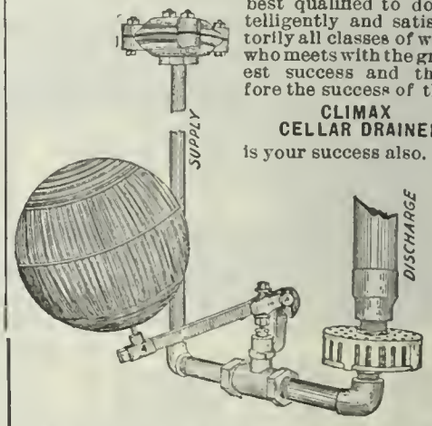
hence the unqualified success others have experienced with the

CLIMAX CELLAR DRAINER

should induce you to use it also Your customers need This Drainer, and you should write to-day for circular and prices, because it is the Plumber best qualified to do intelligently and satisfactorily all classes of work who meets with the greatest success and therefore the success of the

CLIMAX CELLAR DRAINER

is your success also.



Years of effort have enabled us to produce a Drainer of marvelous perfection, entirely free from stuffing boxes, springs, packings and washers; a result not accomplished by any other manufacturer.

The simplicity, reliability and superiority of the CLIMAX CELLAR DRAINER are proverbial.

Sold by all Jobbers. Manufactured by

C. M. KEMP MFG. CO., - Baltimore.

LEATHER and RUBBER WASHERS,

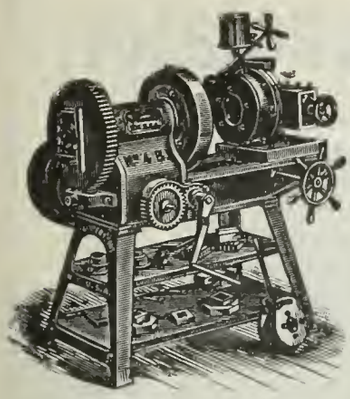
Machine cut, at less price than can be cut by hand. Send Sample for prices.

I. G. MARSTON & CO.,
200 Ruggles St., Boston, Mass.

— SOMETIMES.—"Do you think that the receiver is as bad as the thief?"

"Sometimes, and occasionally he is as bad as the original Board of Directors."—*Judge.*

D. SAUNDERS' SONS,



MANUFACTURERS OF

PIPE CUTTING AND THREADING MACHINES.

All sizes ¼ inch to 18 inch for Pipe Mill, Gas and Steam Fitters' use. Tapping Machines for Steam-Fittings, also

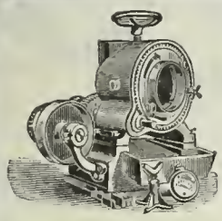
Steam and Gasfitters' Hand Tools.

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No. 4 B Machine, ⅛ to 4 inch. Hand or Power.

No. 25 Atherton St., Yonkers, N.Y

FORBES PATENT DIE STOCK



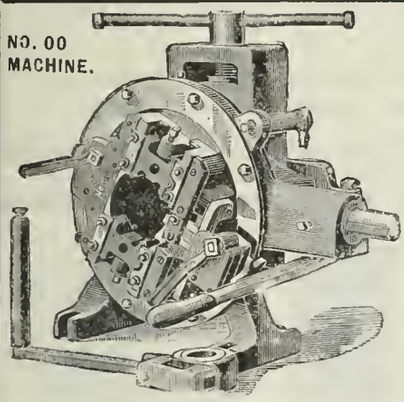
FOR HAND OR POWER.

Occupy less floor space, require less power to run, more simple of construction, far cheaper than any other machine of same range.

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THE CURTIS & CURTIS CO., 56 Garden Street, BRIDGEPORT, CONN.

NO. 00 MACHINE.



NO DUST OR CHIPS

Can interfere with the work of

Armstrong's Pipe... Threading Machines

(HAND OR POWER).

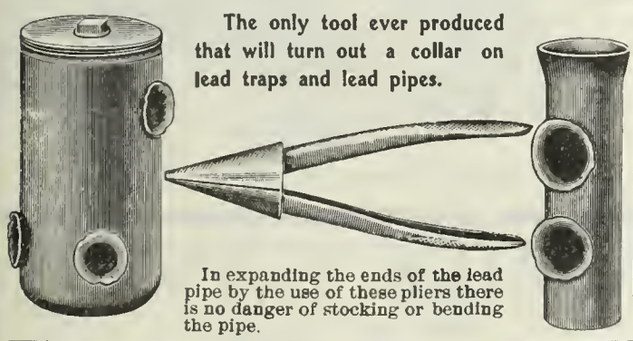
Moving parts run in oil in covered chambers. For other strong points, see catalogue.

ADJUSTABLE STOCKS AND DIES.

THE ARMSTRONG MFG. CO.,

139 Centre St., N. Y. Bridgeport, Conn., U. S. A.

The Anderson PATENTED. Lead Pipe Expanding Pliers.



The only tool ever produced that will turn out a collar on lead traps and lead pipes.

In expanding the ends of the lead pipe by the use of these pliers there is no danger of stocking or bending the pipe.

"PLUMBER'S BEST FRIEND."

PRICE $1.25.

Send for Discount.

Sample pair sent by mail to any point in the U. S., postage paid, on receipt of price.

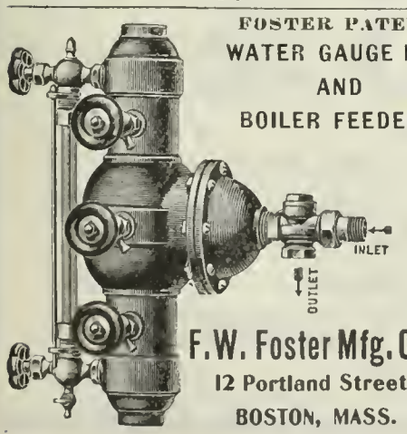
Manufactured by THE

Anderson Coupling Co.

PORTLAND, CONN.

FOSTER PATENT

WATER GAUGE BOX AND BOILER FEEDER.



F. W. Foster Mfg. Co.,

12 Portland Street,

BOSTON, MASS.

ALWAYS IN STOCK.

ALL SIZES OF

Galvanized range boilers, expansion tanks and boilers with copper tube coils inside for heating water by steam.

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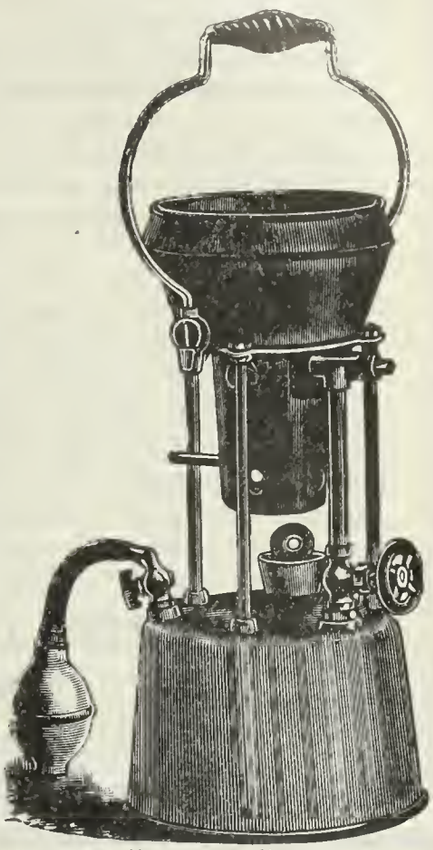
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WOLFF'S IMPROVED PLUMBERS' FURNACE,

The "DURO."



THE "DURO" "F" 1241.

PRICES UPON APPLICATION.

Quantity shipments are packed in cases 6 and 12 furnaces each.

The "DURO" Plumbers' Furnace

Has Drawn Steel Reservoir
Heavily Galvanized.

Drawn Steel Coil Cup.
Wrought Steel Bottom.
Patent Wire Handle.
Improved Filling Plug.
Safety Air Cock Joints.
No Cast-Iron Parts.

It weighs less than any other Furnace now in use.

In placing on the market

Our Improved Plumbers' Furnace

we have fully succeeded in producing ***the best furnace made.*** Most perfect in every detail. Of the highest efficiency. In operation, positive and reliable. Of substantial construction; combining lightness, strength and durability, at no more cost to the trade than the old style.

All component parts are interchangeable, being accurately made and fitted before shipment.

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TRIMO PIPE CUTTER



Decided improvement. Less friction. Can be changed from a roller to a three-wheel cutter. Extra wheels in the handle. Send for catalog.

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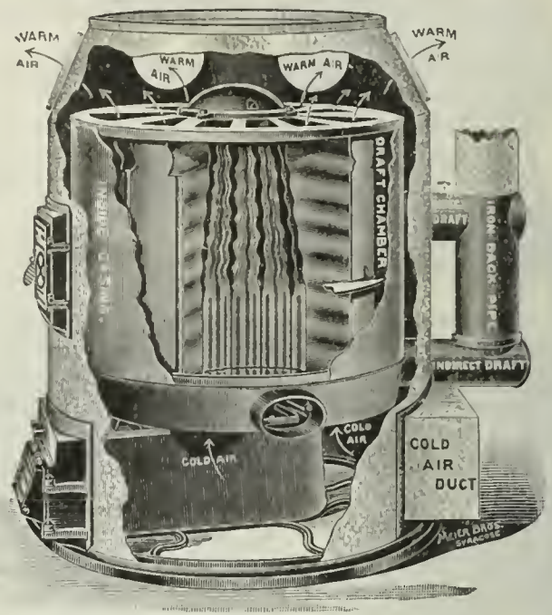
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THE PRINCIPLE

Of the Kelsey is to warm great volumes of air by bringing it into **actual contact** with an **extensive** and **properly heated** surface.

This is accomplished by sending the air in **separate channels through** the long hollow corrugated cast iron sections which form the fire chamber.

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We are ready to hear from you!
Lines more complete and better than ever before.
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DO NOT DELAY.

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THE METAL WORKER.

NEW YORK AND CHICAGO.

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Enormous Consumption of Pig Iron.

The enormous current consumption of pig iron is fully reflected in the monthly statistics published by *The Iron Age*, which show that during the month of January the United States produced, according to almost complete returns, over 1,450,000 tons of pig iron. In spite of this the furnace stocks of iron declined from 218,084 tons on January 1 to 154,200 tons on February 1. This means that over 1,500,000 tons of pig iron were melted in the United States during January, which would be at the rate of 18,000,000 tons a year. This is an extraordinary record. *The Iron Age* estimates that the weekly capacity of the furnaces in blast on February 1 was 340,612 tons, as compared with 298,460 gross tons on January 1 and 324,761 tons on December 1, 1901, which was the previous highest record. Notwithstanding this enormous output, it would seem, judging by the January rate of consumption, to be inadequate if there is no hitch anywhere in the whole chain of industries, and even if a few old stacks and a limited number of new furnaces are put to work. Unfortunately disturbances to production have shown themselves this month. Storms have again thrown the whole transportation system in important sections into disorder and a number of furnaces have been forced again to resort to banking. It is considered very doubtful, therefore, under the circumstances, whether the output for February, at the record its first day held forth, will be realized, although every pound of it is needed.

Hindrances in Retail Business.

Business in every line is necessarily attended by difficulties and hindrances. These are accepted as a matter of course by the intelligent merchant, who, recognizing them, faces in a practical and sensible way the problem as to how they are to be met and overcome. His endeavor is, in spite of them, to make a success of his business.

Many of the hindrances in the hardware trade, for instance, are connected with the innovations which are being introduced in the old ways of doing business, as illustrated in the catalogue houses and department stores. Others are the result of competition within the trade, as merchants in many places are forced to compete with jobbing houses and manufacturers as well as their own legitimate rivals. The attractions offered by the larger towns and cities have, too, an important influence in drawing customers from the rural districts and smaller villages. In special lines the fact that high prices are prevailing, owing to the operation of combinations or other causes, is recognized as having a repressing effect on sales and profits, although this influence is not especially marked in prosperous times like the present. The increasing expense of doing business as it becomes more complex and takes a higher plane, thus keeping pace with the commercial progress of the times, is a factor which must be constantly reckoned with. The wise merchant must take these and other similar matters into account as the conditions under which it is necessary for him to carry on his business. In many instances these difficulties are so positive and obstinate that the task of mastering them presents a serious problem.

There is, however, another class of difficulties which are to a good extent within the merchant's control, and which it behooves him to eliminate from his bundle of troubles. Surely the external and unavoidable hindrances should be sufficient to satisfy any reasonable man, without the addition of others which are unnecessary, and at the same time are frequently the most serious obstacles to the success of the business. Most of these come under the head of bad business management, and result from the inattention or personal limitations of the merchant. Among the hindrances of this character are the following: Letting things get into a rut; suspicion of other dealers; incompetent clerks; little knowledge of the business; paying too high prices for goods; leaks at the money drawer; investment of needed capital in outside enterprises; overbuying; unnecessary cutting of prices, carrying incomplete stocks; lack of attention to business; giving too much credit; losses through bad accounts; lack of business system; refusing to recognize changed business conditions. It is easy for the merchant to discover and denounce the things in his circumstances or in the trade at large which militate against success, but it is far more difficult and far more profitable for him to find out the things in his own establishment which are hindrances to his success, which, if corrected, would give a new tone to his business, increasing both the pleasure of transacting it and the profit derived from it.

The Fire Danger.

The fire record of the past week or two is startling in its extent and in the serious character of the losses caused by the disasters. The columns of the daily press have fairly teemed with accounts of conflagrations, great and small, in various cities and towns throughout the country. On one day alone—Sunday last—no less than six great fires occurred, including the destruction of a large part of the business section of Paterson, N. J., with a loss conservatively estimated at $8,000,000; a great factory fire in Brooklyn, involving $400,000, and a dock fire in Jersey City at a loss of $300,000, with other conflagrations in St. Louis, Scottsville, Ky., and Wapella, Ill., aggregating a loss of another $400,000. These, together with the great blaze in Waterbury, Conn., last week, which wiped out $2,500,000 worth of property in the center of the city, and disastrous conflagrations reported this week in Springfield, Ohio; Springfield, Mass., and other places make the record for the first half of February an exceedingly serious one. The recent spell of ex-

treme cold, accompanied by strong winds, often making the efforts of the firemen futile, is doubtless the main cause of this epidemic of fires, and February is usually accounted one of the worst months of the year, from the point of view of the insurance companies. But it would seem that much of this terrible waste of property, and too often of life, by fires should be obviated in these days of progress. The methods of fire fighting, we are told, have kept well abreast of the advance of the times. Yet, in the cases of Waterbury and Paterson, they were found utterly inadequate to cope with the existing conditions. In both cases the flames, originating in inflammable structures and fanned by high winds, were quickly driven over neighboring buildings, starting a conflagration which the utmost efforts of the firemen were powerless to check. This would be the case in any place in which flimsy structures are permitted to exist alongside of more stable buildings. Stringent building laws and their strict enforcement and the adoption of fire proof construction in the crowded centers of population, while not an absolute panacea, would seem to be the best check against fires in cities. That has been the experience of New York, where there has been, of late years, a marked freedom from widespread fires. At the Paterson fire, it was found that the only large buildings which remained standing were the only three of modern fire proof construction existing in the burned area of the city.

The Cultivation of Foreign Trade.

United States consuls and others acquainted with commercial conditions abroad constantly reiterate the advice to American manufacturers and exporters desirous of securing foreign orders to send representatives directly to the foreign field that they wish to cultivate, taking with them, where possible, samples of goods. The result of such a method of securing foreign trade is illustrated in a recent report to the State Department by our consul at Smyrna. He says that a representative of a New York export house recently visited Constantinople with his samples, and in about three months had sold $40,000 worth of American goods. From thence he went to Smyrna, hired a room and displayed samples of several lines of tools, shelf hardware, cutlery, leather and toys, and in four weeks sold $25,000 worth. The consul points out that it would have been impossible to get this business by correspondence, through the United States Consul or otherwise, or by the distribution of catalogues or other advertising matter. A good traveling representative with a line of samples and having, if possible, the co-operation of some substantial native house, is almost always able to pave the way for an extensive business in American goods, provided the lines that he offers are suitable for the localities in which he operates. Evidence is multiplying pointing to the comparative ineffectiveness of catalogue advertising in foreign countries, especially where, as in so many instances, the catalogues are sent abroad in the English language and with prices in American currency. There is nothing like being on the spot and having something substantial to show to the foreign buyers, who are not all as intelligent or as easy to interest in goods of foreign manufacture as might be desired.

Modern Business Facilities.

Probably but few people realize what an extraordinary revolution in the methods and facilities for doing business has been accomplished in the past twenty or twenty-five years, and under how much pleasanter and more comfortable conditions we carry on our work to-day than our predecessors enjoyed less than a generation ago, before the general introduction of electric lights, elevators and mechanical heating and other appliances, together with the innumerable labor saving and comfort securing devices that are now common in modern business offices and buildings. Twenty years ago the telephone and typewriter were practically unknown adjuncts to the business office. They were regarded more or less in the light of scientific or mechanical toys. To-day they are among the essentials of every business office. And so with many other modern facilities which are now looked upon in the light of ordinary, every day equipments for doing business. Then the change in the character of the quarters in which business is done to-day is very marked. Some of the wealthiest firms in our large cities a generation ago were content to carry on their business in dingy and ill lighted and ventilated quarters in shabby old buildings located on side streets. To-day it is a poor and unaspiring concern that is content with less than a suite of airy rooms, well lighted and heated, in one of the large modern office buildings. Indeed it has become almost essential to the reputation of a business house that the accommodations it provides for its employees should be of a comfortable and even luxurious character. How hard would it be for us to be forced to go back to the conditions and surroundings which existed in the business world a quarter of a century ago, and equally so to the slow and comparatively laborious methods of doing business that were in vogue in those days. Modern progress has been especially marked in this direction. And, with the strenuous and exacting life of the modern business man, it is well that the doing of business has been so greatly facilitated. With all of the up to date accessories in the modern business establishment as much work is now done in one hour as would have taken the same number of people a whole day to accomplish before the modern facilities were introduced.

The annual report of the Board of Electrical Commissioners of South Norwalk, Conn., one of the few municipalities which both owns and operates a municipal lighting plant, showed that during the fiscal year ended October 12, 1901, gross profits of $7496 were realized from the operation of the plant. The city supplies street and commercial lighting, and also power. The report shows that the commercial service practically doubled during the year, and the commissioners advise that an enlargement of the plant will shortly be necessary. This experience in municipal ownership is certainly encouraging to the advocates of that policy, especially as it is understood that the rates charged by the city of South Norwalk for electric lighting are considerably lower than they would be under any system of private ownership.

Light and drainage may hereafter be procured for Baltimore, Md., by the adoption of a plan which presents many novel features and great possibilities. The method proposed, as described by an exchange, is to build a canal between the city and the Susquehanna River, which will convey a sufficient amount of water to flush the harbor and produce the sanitary conditions needed for over a million population. The water would be brought in at an elevation of about 125 feet—a fall, which, it is claimed, would furnish power rivaling that of Niagara. With it the city could light the streets and operate the Water Department pumps, and it would have enough left to supply all the inhabitants of Baltimore at a much lower rate than the cost of steam, which will produce a revenue of from $1,000,000 to $2,000,000 annually. The canal would be about 35 miles long, and, if it could be excavated through earth, would cost about $4,500,000.

WHAT SHOULD THE FURNACE MANUFACTURER KNOW?

BY G. R.

The headline of an article by "J. K." in *The Metal Worker* of January 25 was, in my opinion, unfinished. If it had read, "What Should the Manufacturer of Furnaces and the Furnaceman Know?" the field would have been more fully covered. However, the question, as it appears, should be well taken, and the furnacemen throughout the country should endeavor to dissect the inquiry and give some good information on the subject.

In the first place, I will ask why there have never been any fixed rules or tables established for hot air heating? This question is easily answered. Because there is hardly a furnace on the market properly proportioned, and unless a furnace has enough heating surface for the grate surface it is a case of guess work from beginning to end. Ten to one the furnace not proportioned right will give trouble. Then the furnaceman's trouble begins. He kicks to the manufacturer, and the manufacturer condemns the furnaceman's work. Very often the work should be condemned. My experience has been very extensive, and, in examining a large amount of furnace work, I find the furnaces giving the best results to be those having from 40 to 50 square feet of radiating surface to one of grate. There are furnaces on the market having not more than 12 square feet of surface to one of grate, and they are rated to heat from 24,000 to 30,000 cubic feet of space. Possibly they will do it under good conditions; but for a general class of work they will only do it for a short time, and then only with an extravagant waste of fuel, after which they are fit only for the junk dealer; whereas, if they were properly constructed and had plenty of radiating surface they would last indefinitely.

I have exhausted all means known to mankind to find some positive data on hot air heating, but as yet nothing has been found that excels good judgment and common sense. I have searched the high schools, the libraries, the technical schools, and worried the patience of as many heating and ventilating engineers as could be learned of, but all in vain. There are a few practical books on hot air heating, but, as a rule, the everyday furnaceman objects to spending from $1.50 to $5 for a book that he is not sure will help him in his daily work. The best rules that I could give here would be: Use a furnace with plenty of radiating surface; be sure of a good chimney; locate furnace as centrally as possible; have large hot air pipes, and registers in proportion, and, last but not least, give the furnace plenty of cold air. If you are afraid you will have too much cold air, put a damper in your cold air duct. It is easier to regulate it than to have the job condemned. There are hundreds of installations giving trouble from this simple cause.

I have installed work where the furnaces were well proportioned, and by following some self made rules could get the best results. But, on the other hand, where the furnaces were not properly proportioned, the same rules would fail. Therefore the importance of manufacturers properly proportioning their goods is evident. Of course, it is important to have short runs of pipe, registers well located and avoid abrupt bends, &c. I hope the furnacemen throughout the country will keep the subject before them until it is thoroughly discussed. Why do not the heating and ventilating engineers help in this matter? No doubt they would be benefited as well as others.

I will further say, as a rule, the architects throughout the country are not practical in hot air heating by any means. The architect will plan a building, and, of course, has an idea as to what furniture the building will be furnished with. To accommodate a sideboard or china closet, he will make the heating man place a register where it will not be effective enough to heat the room. At other times he will try to force a heating contractor to put in a side wall register in a 4-inch partition wall on the first floor, where it will be absolutely impossible to get a pipe large enough to heat the room properly. The builder makes a great mistake in not letting the heating contractor lay out his system and have all openings of proper size and location provided for in the beginning. He cannot expect good results if he waits until the building is nearly completed and then begins to look out for his heating apparatus.

My opinion is, the practical man is the one who will have to force the advance of hot air heating. We should try to convince the manufacturers that we need more effectual heating surface in their furnaces. Then we can give good results with their goods. I am trying to get the school boards in my section interested enough in heating and ventilating to have it taught in the public schools. Some of them are taking well to the subject. I trust this will encourage others to discuss this branch of their work, and I will anxiously look for their replies to "J. K.'s" question. Later on I hope to furnish the readers of *The Metal Worker* with some data which I have found to work successfully.

Presentation to Fred. W. Gardner.

On the eve of his retirement from the active management of the Chicago house of the Michigan Stove Company Fred. W. Gardner was presented by all of the



Presentation to Fred. W. Gardner.

traveling representatives of the Chicago branch of the concern with a beautiful solid silver loving cup, as a token of the attachment and esteem of those with whom Mr. Gardner had been so long associated. The illustration of the cup, showing its inscription, given herewith, indicates the handsome and massive character of the gift. In adition Mr. Gardner was presented with a beautifully bound edition of the complete works of Thackeray, with the compliments of all the office employees, and, to make his cup of happiness full to overflowing, a Pianola was sent to his house, with the compliments and best wishes of his fellow directors of the Michigan Stove Company. Seldom does a man sever a business connection under such pleasant circumstances as Mr. Gardner, carrying with him such substantial tokens of the good will and esteem of those whom he leaves behind.

At the annual meeting of the stockholders of the Sheridan Stove Mfg. Company of Quincy, Ill., recently held at the office of the company, Fourth street and Payson avenue, it was decided to increase the manufacturing facilities and at the same time enlarge the force of employees. We understand that a new warehouse will be erected and the molding room will be extended to Fourth street, thus giving room for about double the present number of molders. The stockholders also elected a Board of Directors and officers for the ensuing year.

GOOD FURNACE WORK.

BY A. F. M.

It is a pleasure to me that so many in the furnace trade have discussed different phases of the work in *The Metal Worker*, in the last few months particularly. I congratulate the trade on the desire, which seems to be clearly shown, of doing better work and the best work that the different men know how to do. That good work is being done in the furnace trade is beyond question, but I would divide the good work that is being done under two heads—the practical and the theoretical.

GOOD PRACTICAL WORK.

To do good practical work naturally requires a comprehensive knowledge of every detail, which means that when a customer comes the opportunity must be embraced to explain just what will be the best thing for his particular building. This should be done on a cause and effect plan, so that if a competitor is willing to heat the building for less money the customer will be sufficiently well informed to know what he wants and won't be satisfied with the character of job which the lower bidder is willing to do. I suppose many furnacemen would look on this purely as selling, but I would like to point out that a man may be a good salesman and not be able to do what I have just pointed out as an important part of the work.

Good practical work should include the selection of a furnace, of whatever grade and price, and so constructed that it will be gas and dust proof and reasonably durable, and as efficient as the market will afford for the price paid. This will require some study of different constructions and of the various goods on the market, and may necessitate the purchase of furnaces from two or three different manufacturers in order to meet all the demands of your community. It is important, when the sale is made, that the furnace be located in the building at the point which your judgment decides is best, regardless of the opinion of the architect or the owner. You can rest assured that you will have to be responsible for any failure on the part of the furnace to measure up to their views of what it should do, and they should be impressed with the fact that, having made a specialty of your line of business, you are best qualified to judge where the furnace must be placed in order to do its best work.

Then there are different kinds of sheet iron work. The drums of a sheet iron furnace and the casing and bonnet of any kind of furnace must be made in a substantial and workmanlike manner, so that they will fit snugly and hold together with any reasonable treatment. There can be no doubt that advantage attends the connection of the furnace collars with the top so that they will be practically air tight, and set at the right angle so that the hot air pipe may be carried in a direct line to the register or stack it is to supply. The tin for the hot air pipe should have sufficient body and be coated heavily enough to pass through several seasons without rusting. Benefit will be derived if a small length of pipe is finished with a bead about 1 inch from the end, so as to insure stiffness and an air tight joint. The bead should be small, and if the pipe is carefully fitted it may be omitted for the purpose of avoiding friction. The connection of the round pipe to the register boxes and vertical stacks, even in the cheapest contract work, should be made with an enlargement and so arranged as to avoid abrupt turns and friction. In many instances a little ingenuity will accomplish this result as cheaply as abrupt connections can be made.

The failure of different pipes to receive and furnish the same volume of hot air is due in many instances to just such little things as the connections at the bottom of the stack and at the register box. Furnacemen must learn the importance of these comparatively small things, otherwise much of their work will be unsatisfactory to customers and be found extravagant in the use of fuel. If the furnaceman is to escape the disagreeable comparisons made between the system of heating which affords him a living and other systems of heating, he must labor to avoid friction at every point by the use of good workmanship, good judgment and good materials.

GOOD THEORETICAL WORK.

The furnaceman has made practically no records for the basis of the theories which have guided him in his practical work. To accomplish what is a growing necessity in this field selfishness must be obliterated and a broad spirit of generosity must be cultivated. The man who asks "Where do I come in?" cannot be expected to be of much assistance in this work. The need of it, however, has left this branch of heating open to the imputation that it is by no means an exact science, but is governed by thumb rules, cut and try sheet metal work or "I guess that pipe will be big enough" methods in designing work. I would suggest that furnacemen keep some record of the work they do. This would be a comparatively small task, which will only need a few outlines for a beginning, experience subsequently suggesting more. As a beginning I would suggest that the records include the square inches of grate surface and the square feet of heating surface in the furnace; the space heated; the wall surface and the glass surface; the area of the hot air pipes leading to the different rooms; their combined area and the area of the cold air supply pipe.

If a few of the readers of *The Metal Worker* would just go over some of the jobs that they have done in houses and tabulate the record, and then strike an average on the different jobs, such a table would be of great interest and value. Those who have done much church heating could present an interesting table of that character of work. If besides this table the temperature of the air flowing from the registers was recorded, with the record of the temperature on the outside, this information would add to the interest and value of the records. If the furnaceman enlisted the aid of men working in his shop in making such a tabulation and record, and the record was kept so that it could be readily referred to by all of the men, benefit would be derived that would more than pay for the time spent in the compilation; there would be less errors in judgment, failures in heating and complaints, and a better reputation in the community would be built up, with the result of better profits to the furnaceman.

Cleveland Co-operative Stove Company.

The annual meeting of the Cleveland Co-operative Stove Company of Cleveland, Ohio, was held on Saturday, February 1, when the following directors were elected by the stockholders to serve for the ensuing year: N. P. McKean, J. H. O'Brien, Jacob Widlar, Stephen Buhrer, C. H. Coit, Capt. P. Borland, James H. Clark, Sr., M. G. Watterson and John Gill. The directors met after the stockholders' meeting and elected officers, as follows:

President, N. P. McKean.
Secretary and General Manager, C. W. Scott.
Treasurer, Robert Neil.
Superintendent, Jacob Widlar.

A Colebrook "Poem."

IF YOU DON'T YELL YOURSELF THERE WILL BE NO YELL FOR YOU.

"Silence is golden" may do very well
For folks who have secrets they'd rather not tell;
But if you have goods you desire to sell,
You'll find it more "golden" to stand up and yell.

We yell for Colebrook's—the best of cement.
If you're not users and will only consent,
Samples and prices to you will be sent—
Then you'll be users and we'll be content.

The above is printed at the head of a card which is being distributed by W. H. Colebrook Sons & Co., Syracuse, N. Y., in the interests of their varied line of stove and furnacemen's supplies, but particularly of their asbestos cement for stoves and furnaces.

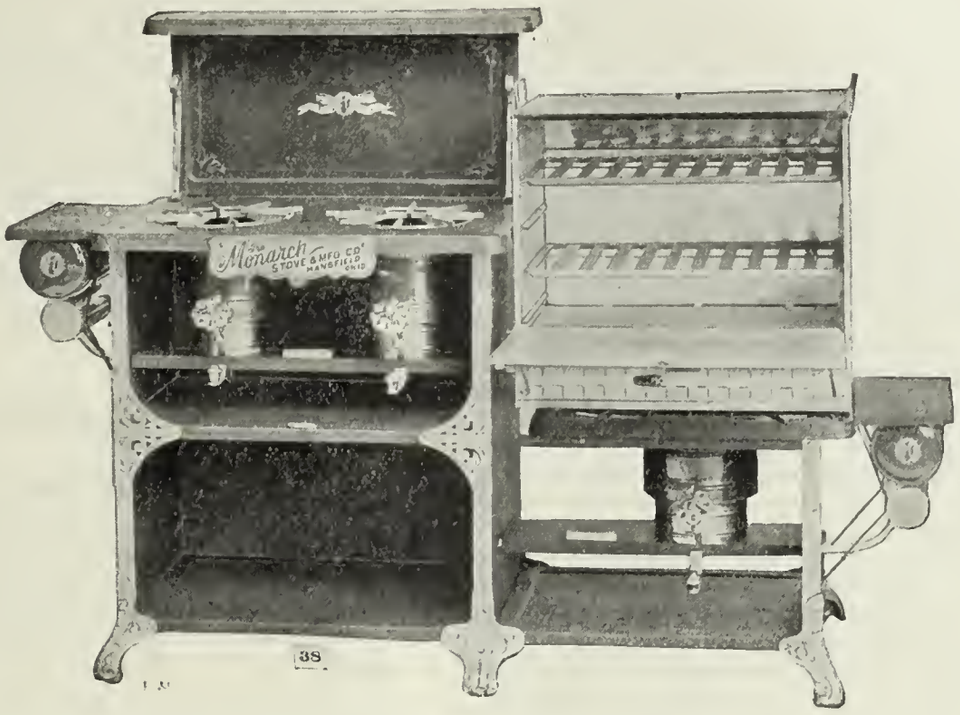
Death of Valentine Clad.

Valentine Clad, founder of the firm of V. Clad & Sons, Incorporated, of Philadelphia, died on Tuesday, February 12, at his residence at Devon, Pa., after a short illness, of fatty degeneration of the heart, aged 75 years. Mr. Clad was born in Alsace, France, and came to this country in his early youth. In 1853 he established himself in the manufacture of French ranges, cooking apparatus, confectioners' tools, &c., a business which grew to be one of large importance, the firm's products being now in use in all parts of the country. The firm of V. Clad & Sons was formed in 1892, and incorporated in 1896. Mr. Clad took an active part in the business up to a few years ago. He is survived by a widow, two daughters and four sons, three of the sons being associated with him in business. The funeral services were held on Friday at St. Monica's Roman Catholic Church, Berwyn, Pa.

THE CHESTER STOVE COMPANY, Manchester, Va., who were established in November, 1898, expect to enlarge their plant the coming spring. They do all kinds of iron foundry work, their specialty being Stoves, of which they make a full line

The Monarch Wickless Blue Flame Oil Stoves.

The trade will be interested in the Monarch wickless blue flame oil stoves for this year, made by the Monarch Stove & Mfg. Company, Mansfield, Ohio, owing to the adoption of their new "student lamp tank construction," which is said to positively prevent overflowing and insure a continuous flow of oil for the burners in exact quantity to further the best results. This special burner is said to develop a heat of great intensity. In Fig. 1 a view of the company's popular pattern stove is shown, having two top burners and a double oven burner. The construction is of the cabinet frame type, having a high shelf with a solid back protecting wall. The tanks for supplying the burners, shown at the right and left of the stove, are made of brass and the flow to the burner is governed by a direct action needle valve. This stove stands 27 inches high and has a top 25 x 17 inches. Fig. 2 shows a three-burner Low Junior, which has a top 33 x 17 inches and stands 14 inches high. The construction and equipment is substantial and complete. The stoves are provided with a high shelf and are handsomely nickel trimmed. These stoves are fully shown and illustrated in the new catalogue which the house has for distribution.



The Monarch Wickless Blue Flame Oil Stoves.—Fig. 1.—The Popular Style Monarch.

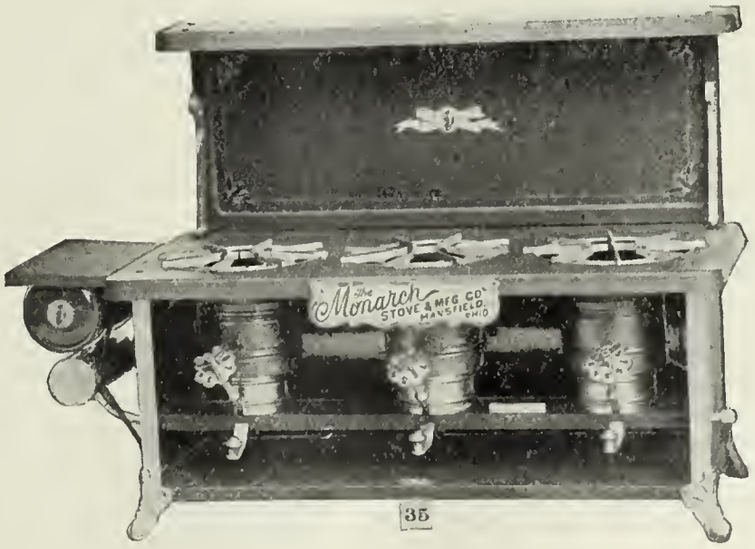


Fig. 2.—The Low Junior Monarch.

ODD PLATES.

The trade-mark of the Continental Stoves, made by the Buckwalter Stove Company, Royersford, Pa., adorns one corner of a handy desk blotter which Ed. Q. Smith is sending to the trade, so that it will not be forgotten that "Smith Sells Stoves."

W. H. Gruenhagen, St. Anthony Park, Minn., is making a specialty of the Monarch line of Gasoline and Blue Flame Oil Stoves, made by the Monarch Stove & Mfg. Company, Mansfield, Ohio, and the Eclipse line of Steel Ranges and Cook Stoves, made by the Eclipse Stove Company of the same city. He is preparing a large display room for showing these goods at the Midway Exposition, which will open in St. Anthony Park on March 1. He invites members of the Stove trade of the Northwest who attend the exposition to make a point of examining the cooking and heating goods which he will have on exhibition.

The Wireton Heating Company, Blue Island, Ill., manufacturers of Quaker, Panama, Hoffman and Farquhar Furnaces and Wireton Draft Regulators, suffered from a serious fire on the 6th inst. Their buildings were almost completely destroyed, inflicting a loss of $50,000, covered by insurance to about half that amount. The company have been building up an excellent trade and the fire comes at a most inopportune time, as it interferes so decidedly with the regular prosecution of their business. Those interested in the company are not dismayed by their misfortune, but as speedily as possible after the insurance is adjusted will proceed to rebuild, and it is their determination to provide better facilities in every respect than the old establishment possessed. They hope to get the new works in operation within 90 days at the outside.

The Excelsior Steel Furnace Company, Chicago, have secured control of the Orelup patents on Hot Air Radiators and Hot Water Boilers and expect to make these goods as soon as the necessary arrangements can be completed. The Boilers are designed chiefly for furnishing hot water supply for city apartments, for which there is a large demand.

The plants of the Springfield Foundry Company and the Progress Stove & Furnace Company, at Springfield, Ohio, were destroyed on Monday by a fire which visited the big East street shops, built by William N. Whitely, the reaper manufacturer, and which are said to be the largest shops of their kind in the country. Both concerns were located in them. The Springfield Foundry Company's loss is estimated at $100,000 and that of the Progress Stove & Furnace Company at $30,000, which losses are partly covered by insurance.

The Gurney Foundry Company, Limited, Toronto, Canada, are sending out through the mails a large sized postal card advising the trade that they have illustrated catalogues of their extensive line of Heating and Cooking Apparatus which they will be glad to mail on receipt of request to any who are interested in these goods. A feature of the card is a picture in colors of a terrestrial globe, divided into four quarters, the statement being made, in explanation thereof, that the company supply goods to "the four quarters of the earth."

An ingenious bit of advertising has been adopted by A. Weiskittel & Co., Baltimore, Md., in the interest of their new Fire King Enameled Top Gas Ranges. The card presents views of two show windows; one, in which their goods are displayed, is surrounded by a throng of shoppers, while across the street is the show window of another Stove establishment, with no onlooker except the clerk.

The Tubular Heating & Ventilating Company, Philadelphia, advise us that the demand for the Forbes Furnace has been exceedingly large during the past season. The 1901 improvements to this Heater are giving unusual satisfaction to their users, particularly the ⅛-inch steel manifolds, which, they claim, will wear for a lifetime.

E. B. Colby & Co. are sending to the trade announcement that owing to the rapid growth of their business they are compelled to secure larger quarters, and have decided to locate their office at their large warehouse at Hoboken avenue and Monmouth street, Jersey City, N. J. They have fitted up offices and sample rooms, and will be in a position to give their customers improved shipping service. They expect to be in their new quarters on February 25, and will be glad to receive the trade and show them their line of goods.

The Portsmouth Stove & Range Works, Portsmouth, Ohio, are having plans drawn for a new addition to their present building.

John Bergman, president of the National Foundry & Mfg. Company of Terre Haute, Ind., is reported to be considering the establishment of a Stove foundry and manufacturing plant at South McAllister, Ind. Ter.

A picture of two bakers in bakery costume running a neck and neck race is entitled "Quick Even Bakers" on a blotter distributed by the H. Adler Company, Pittsburgh, to draw attention to these characteristics of their Acme Gas Stoves and Ovens.

Hardware Organizations.

Minnesota Retail Hardware Association.

The annual convention of the Minnesota Retail Hardware Association will be held in the Ryan Hotel Annex, St. Paul, February 26-28. Among the papers which will be read during the meeting are the following:

"Possibilities of Trade Organization," by T. T. Bacheller.

"Talk on Insurance," by C. A. Hatch.

"The Three Essentials," by P. W. Lyon, Minneapolis.

"Advertising," by M. De Motte, St. Paul.

Besides the papers there will be many other interesting features, so that a pleasant and profitable time is promised to those who attend the meeting. It is suggested that the convention will afford a vacation period at a time of the year when the merchant can leave his business under the most favorable circumstances and thus freshen up his mind for the activity consequent upon a heavy spring trade. A fare of one and a third has been secured over all railroad lines in the State, on the certificate plan. Tickets will be good three days before and three days after the convention. Further particulars in regard to the meeting may be obtained from Thomas McCracken, secretary of the association, whose address is 323 Boston Block, Minneapolis.

North Dakota Retail Hardware Association.

The North Dakota Retail Hardware Association has just issued its souvenir programme for its fifth annual meeting, to be held in Fargo on February 19 and 20. The programme is a book of nearly 200 pages and is attractively printed in two colors. It is certainly the largest and most impressive programme yet issued by a hardware association. The special feature of interest in the book is the presentation of portraits of a large number of officers and prominent members of State hardware associations throughout the country. A list of the different State retail associations is also given, together with the names of the present officers and executive committees, so that the volume is of very general interest to those who are identified with the organization movement. It is well printed on paper of excellent quality and is very creditable to the association. A full list of the legitimate hardware dealers of North Dakota is also presented, those who are members of the association being indicated by a star. An inspection of the list shows that the association embraces a great many of the merchants who are eligible for membership.

The programme of the convention shows that it will open on Wednesday forenoon, 19th inst., this session being devoted to welcoming addresses, appointment of committees, &c. In the afternoon papers will be read by H. B. Allen of Jamestown, on "Fakes and Fakirs, or Leg Pulling," and by H. F. Emery of Fargo, on "Some

Difficulties Hardware Dealers Have to Contend With." As much of this session as may be desirable will be devoted to jobbers, manufacturers and their traveling salesmen for discussion of matters of mutual interest. At the Thursday morning session the president's address and secretary's and treasurer's reports will be presented. The final session will be held on Thursday afternoon, when papers will be listened to from O. A. Gallup of Edgeley, "One Way to Compete With Supply Houses;" from James McPhail of Langdon, "Dealers' Asociations, Their Effect and What They May Accomplish," and from L. B. Hanson of Sheldon, "The Practical Hardwareman." The Question Box will be a feature of all but one session. Reduced railroad rates on the certificate plan have been arranged for, and it is hoped that a large representation of the membership will be in attendance. The official headquarters will be at the Hotel Metropole. C. N. Barnes of Grand Forks is secretary of this association.

The Indiana Retail Hardware Dealers' Association.

According to the programme of the third annual meeting of the Indiana Retail Hardware Dealers' Association, to be held at Indianapolis, February 19 and 20, headquarters at the Denison Hotel, the convention will be called to order on Wednesday morning, 19th, at 11 o'clock. At the afternoon session President W. P. Lewis will make his annual address. The remainder of this session will be given up to the reading of papers, as follows:

"Twentieth Century Conditions," T. James Fernley, secretary-treasurer of the National Hardware Association.

"Hardware Store Arrangement," J. D. Warren of the J. D. Warren Mfg. Company, Chicago.

"Window Display and Art of Selling," H. W. Beagle, Rochester, N. Y.

"Up to Date Hardware Advertising," H. P. Townley, Terre Haute, Ind.

Wednesday evening a smoker will be tendered the association. Thursday morning's session will be of an executive character, during which private association matters will be discussed. The report of Secretary-Treasurer M. L. Corey and a paper by Wm. C. Powell of Converse, on "Illegitimate Competition," will be read. The Question Box will also be dissected. At the closing session in the afternoon Chas. H. Shirley of New Orleans will present a paper entitled "Indiscriminate Selling," and reports of the Committee on Insurance and other committees will be read. M. L. Corey, Argos, Ind., is secretary of this association.

N. E. & S. Company's Enameled Steel Wares.

Referring to their new enameled steel ware catalogue No. 3, a review of which was given in *The Metal Worker* of January 18, the National Enameling & Stamping Company advise us that the list prices in the same are in accordance with the change which went into effect on November 1, 1901. The catalogue, they say, contains practically no alterations in the style of their enameled goods, which are well known throughout the country. The three distinct brands of one-coated ware manufactured by the company are turned out at the following factories: National enameled steel ware, at New York; Greystone enameled steel ware, at Baltimore, Md., and Royal enameled steel ware, at Granite City, Ill. The last named factory also makes the patent genuine granite steel ware, a two-coated gray enameled ware of established reputation.

A line of white and white enameled ware is made at their factory at Portland, Conn., and there, as well as at the factory at Milwaukee, they turn out their green and blue mottled white lined ware, which has been placed on the market under the name of Venetian enameled steel ware. The company say that this style of ware is daily gaining in popular favor, and their constant aim is to improve the same, in order to make it the best line of enameled steel ware on the market.

AMERICAN ENAMELED WARE IN ENGLAND.

Our London correspondent writes as follows:

A. S. King, the British manager of the National Enameling & Stamping Company, has just returned from visiting his principals in the United States. After 12 months' experiment he is unusually hopeful of building up a big business in stamped ware and enameled goods in this country. He tells me that hitherto his chief difficulty has been to compete with the cheaper, unselected qualities of German enameled ware in white white and blue white. In grays he practically has no competitors, but his difficulty is to persuade the British buyer that for all practical purposes gray is superior to either of the other colors. The fixed rule of his company only to export selected qualities makes his initial efforts much more difficult, but immediately the reputation of his goods is established trade will be easier. Among some recent valuable contracts he has secured is one for a large number of milk cans for the Dairy Supply Company of this country. These milk cans, from the point of view of simplicity, strength and safety, are a distinct advance upon anything yet in the English market. A. S. King starts the coming year with hopeful prospects.

The dangers of cheap enameled ware are gradually being brought home to the British consumer. Appendicitis is now becoming far too prevalent, and it is alleged in certain quarters that this is due to the increasing use of cheap enameled iron saucepans and other enameled goods. Large quantities of these cheap articles are bought at what are called the "Sixpenny-halfpenny Bazaars," and are undoubtedly rubbish. R. H. Smith, the secretary of the Ironmongers' Federated Association, who claims to be something of an analytical chemist, has recently made some tests on four enameled saucepans. The first he purchased at a "Sixpenny-halfpenny Bazaar," the second was given away with a ¼ pound of tea for 7½ pence, the third and fourth were purchased from ordinary ironmongers and manufactured in Great Britain. A liter of distilled water was boiled down in each saucepan to an egg cupful, the remaining liquid transferred to a platinum crucible, evaporated to dryness, weighed and analyzed. It was found that No. 1 sample contained 12.4 grains per gallon of solid residual matter, and No. 2, 79.36 grains per gallon. The boilings from the British made saucepans yielded no residue. The percentage proportion of the two cheap saucepans worked out as follows:

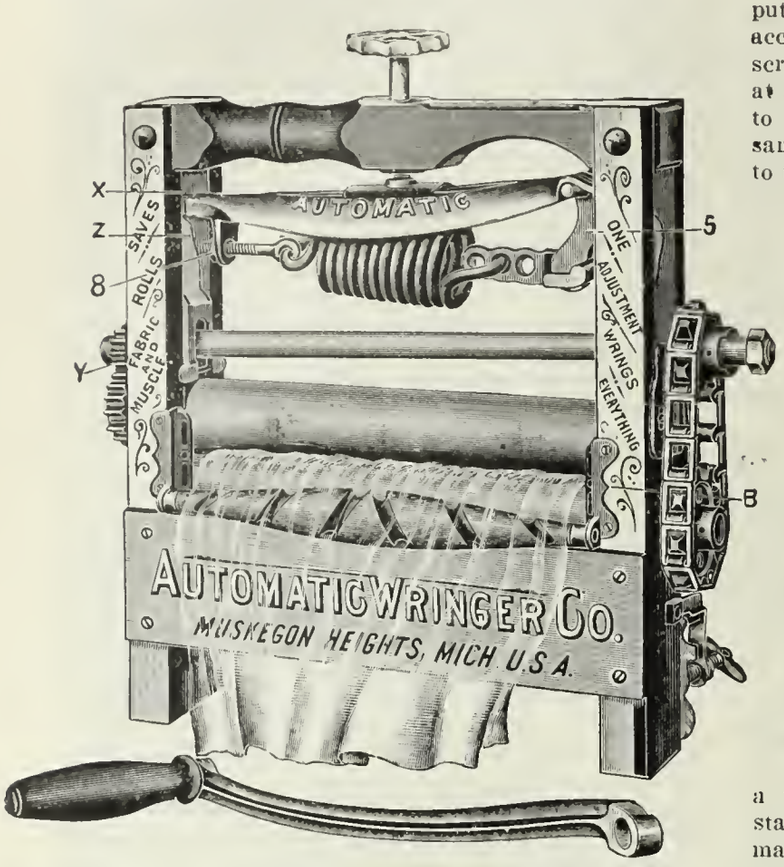
	No. 1. Per cent.	No. 2. Per cent.
Silica	48.20	58.70
Lead oxide	36.84	Nil.
Tin oxide	Nil.	5.57
Soda and lime	14.96	35.73

The enamel on No. 2 sample, although not in itself bad, was so ineffectively laid on that, after the first boiling, quantities of it were detached in the form of sharp particles. It may be within the recollection of your readers that 12 months ago I reported an interview with a British merchant who desired to be put in touch with American enameled ware manufacturers. He received a number of replies, but in every case the price was too dear and the quality too good. After this it may perhaps be found that the recognized high quality of American enameled ware should make it a better marketable article.

THE French Vice-Consul at Rangoon, Burmah, advises his Government that French Refrigerators would sell very well in that country. He recommends to the manufacturers of such goods, however, that they should take into consideration the great heat and moisture prevalent in Burmah. He also points out the necessity of placing all the feet of every kind of furniture containing viands in basins of water, in order to protect them against the attacks of ants, which makes it indispensable that the feet of all Refrigerators should be at least 6 inches high. They should be made of hard wood, capable of withstanding the action of water. It is probable that a market might also be found in Burmah for American Refrigerators.

The Automatic Wringer.

The Automatic wringer, herewith illustrated, is manufactured by the Automatic Wringer Company, Muskegon Heights, Mich. The wringer is so constructed that the full width of the rolls is utilized in wringing clothes, and the pressure at all times is equalized. It is explained that without changing the adjustment the



The Automatic Wringer.

wringer can be used with equal efficiency on a handkerchief or a bed quilt, the adjustment being perfectly automatic. The capacity without changing the wheel screw, indicated by letters X Z, is claimed to be four times that of ordinary wringers, and if necessary can be increased indefinitely. The roll pressure is equalized by a horizontal coiled spring, which has a compound lever on one side, indicated by the figure 5, and a spring tension readjustment on the other side, accomplished by an eye bolt nut, indicated by the figure 8. This equalization of pressure is claimed to save 50 per cent. in labor. The chain gear, shown by the letter B, does away, it is stated, with side friction, and gives perfect freedom of movement to the rolls, which cannot run out of the gear, shown at Y, thereby effecting a great saving of rolls, fabric and labor. An original feature is the spreader, which is the double cone shaped piece having channels running from the center, shown just in front of the lower roll. Owing to its peculiar shape, this spreads the clothes evenly along the rolls and thus causes the fabric to feed without friction. The crank handle used with the machine is a dovetailed malleable casting, which, it is remarked, will not break, wabble, wear out or need bushing. The rolls are constructed of solid rubber, vulcanized on a cold rolled steel shaft, and are made of a special grade of rubber to secure elasticity, resiliency and firmness.

The Newire Corkscrew.

The Rockwell Clough Company, Alton, N. H., are putting on the market a corkscrew, as shown in the accompanying illustration. A novel feature of the corkscrew, it is remarked, is the use of a shoulder placed at a distance from the point which is sufficiently great to allow the drawing of the longest cork and at the same time prevent the screw sinking into the cork up to the handle. The tool is made of strong wire and has

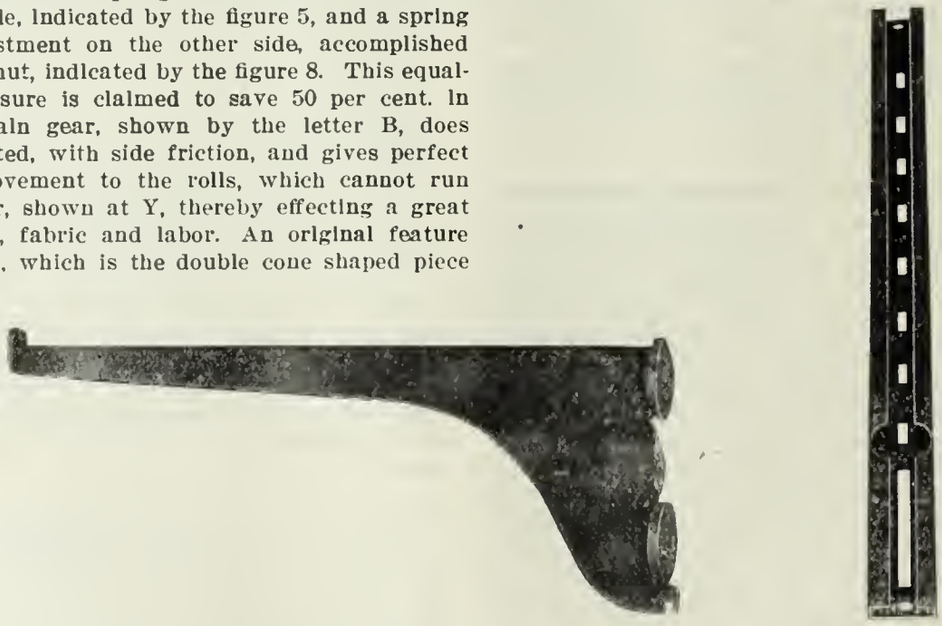


The Newire Corkscrew.

a wood handle firmly attached. The manufacturers state that the style of corkscrew shown represents the maximum of utility at a cost of one-half that of the poorest article of the kind imported.

The Wisconsin Adjustable Bracket.

The Wisconsin Iron & Wire Works, 186 to 190 East Water street, Milwaukee, Wis., have just added an adjustable bracket to their line of hardware specialties, which is herewith illustrated. The bracket consists of two parts. The slide is permanently attached to the wall, and the bracket can then be slipped into place at the bottom and pushed up until the desired position is reached, when the projection at the bottom of the bracket will slip into a hole in the slide and be firmly retained in position. The bracket is made in lengths of 8 to 18 inches, and finished in enamel, nickel or copper plate.



The Wisconsin Adjustable Bracket.

THE WISCONSIN RETAIL HARDWARE ASSOCIATION.

The largest convention in the history of the Wisconsin Retail Hardware Association was the sixth annual meeting, held at the Republican House, Milwaukee, on the 5th and 6th inst. A very large attendance was registered. The first session was held on Wednesday afternoon. After the roll call, to which over 100 members responded, and the reading of the minutes of the last annual meeting, President John Hessel of Antigo read his address.

The following committees were appointed:

TRANSPORTATION: Arthur Heins, Tigertown; C. A. Peck, Berlin.
RESOLUTIONS: A. H. Sheldon, Janesville; Andrew Noll, Chilton.
GRIEVANCES: R. W. French, Ashland; R. W. Puchner, Edgar.
RECEPTION: A. D. Race, Depere; August Schupinsky, Milwaukee.
LEGISLATION: Emil Tietgen, Manitowoc; Robert Suettinger, Two Rivers.
AUDITING: O. P. Schlafer, Appleton; E. H. Ramm, New London.
QUESTION BOX: Harry Krueger, Neenah; John Hughes, Fond du Lac; Ralph Burtis, Oshkosh; C. A. Dewey, Kenosha.
PRESS: L. Findersen, Green Bay; Ralph Burtis, Oshkosh; Geo. W. Cope.

Secretary C. A. Peck of Berlin then read his report, and the report of the treasurer, John Leverenz, was also read, showing a balance on hand of $1078.15. The report of the Committee on Revision of the Constitution was then presented by Vice-President O. P. Schlafer of Appleton, and the revised constitution was adopted section by section. An important change in the new constitution is the consolidation of the offices of secretary and treasurer. Another change permanently provides for the holding of the annual meeting at Milwaukee.

QUESTION BOX.

The next feature was the opening of the Question Box, when the following, among other subjects, were discussed:

Is it advisable in towns of l ss than 1000 population to push the sale of hot air furnaces instead of heating stoves?

The advice given by those who had experience was that if a merchant does not have in his employ a first-class tinner who can put in a furnace, he is better off without the furnace business. A ripple of laughter was caused by a member who stated that in handling furnaces "You get old stoves for your profit."

How can we best get our sons interested in the hardware business with us?

This brought out interesting statements by Mr. Peck and Mr. Schlafer. Mr. Peck interested his sons by making them partners and finds that they are as full of good ideas as himself. Mr. Schlafer has given his son a department in his store, which he manages outside of school hours and is making it a success.

What size of squaring machine is best to buy for a country shop?

It was quite unanimously decided that not less than 30 inches is the proper size.

Why are retailers pledged to carry freight on stoves until the invoices are paid?

This question was explained as relating to cases in which manufacturers assume freight. It was answered that freight is cash and must be paid. Those who buy on credit cannot expect manufacturers to pay their freight. In such cases a cash discount is deducted from the full amount, not deducting the freight.

How can you tell how much you make each day as a merchant?

Mr. Peck explained his method. He keeps a cash book and puts down every sale, at the same time putting down the cost in another column. At night the difference between the two columns shows the profit. This is open to the criticism that clerks of course must know what the goods cost.

ELECTION OF OFFICERS.

The first business taken up on Thursday morning was the election of officers. No Committee on Nominations had been appointed, as it was decided better to make nominations from the floor. Practically no contest was made for any of the offices, a single ballot serving to record the will of the convention. The following list shows the result of the election:

President, O. P. Schlafer, Appleton.
Vice-President, Leonard Findeisen, Green Bay.
Secretary-Treasurer, C. A. Peck, Berlin.
Executive Committee: J. Kornely, Milwaukee, and E. H. Ramm, New London, each for two years; Andrew Noll, Chilton, and H. L. McNamara, Janesville, each for one year.

QUESTION BOX AGAIN.

The Question Box discussion was resumed with the following:

How can we protect our interests against employees not true to our interests?

This question was explained as referring to mechanics employed in members' workshops and not to their clerks. The point was brought out that in busy seasons workmen often become unreasonable and difficult to manage, knowing that if discharged they can readily secure employment in another shop in the same line. It was suggested that the members endeavor to advise each other with regard to employees of this character.

Do you pay for goods that come damaged and you do not accept?

Several gave their experience in cases of this kind, and it was developed that the usual method of procedure is to notify the local agent of the railroad company regarding the damage done, making a claim for the amount involved, but meanwhile paying for the goods, unless it is clearly demonstrated that the damage was the fault of the packer, in which case payment is refused. Most of the members discussing this point stated that they open a regular account with their railroad company, charging the company for damages and crediting them for reimbursements. This discussion ran into a broad discussion of stove repairs broken or lost in transit, and the question of how to handle such repairs to the best advantage in keeping track of them.

What is the best way to mark the cost of goods? Do you add selling expense, and if so, what percentage of cost?

President Schlafer stated that he added freight on heavy or bulky goods, such as nails, &c., but not on light goods, and made no allowance for the cash discount, as that was presumed to cover a portion of the cost of receiving and placing them in stock. No selling expense was added in putting down this cost.

Ought the retailers buy goods of the jobber or manufacturer who also drums the local retail trade?

This brought out a very general answer in the negative.

M. L. Corey of Argos, Ind., secretary of the National Hardware Dealers' Association, strongly urged the Wisconsin Association to take an active part in the affairs of the National body. On motion a standing vote was taken on the question of joining the National Association, which resulted unanimously in favor of such action. President Schlafer then thanked the association for the honor conferred on him by electing him as president, and pledged his best endeavors to advance the objects for which the association stood.

THURSDAY AFTERNOON.

On Thursday afternoon H. L. McNamara of Janesville read an interesting paper on "The Relations of Traveling Men to Retailers." Subsequently the questions of "The Desirability to Retailers to Have Wholesale Houses Not Acknowledge Payments by Their Customers," "Department Stores" and "Gasoline Lamps for Lighting Stores" were discussed. Secretary Peck read a paper by H. C. Scofield of Sturgeon Bay on "The Care and Management of a Display of Retail Hardware." A vote of thanks for their papers was given to Messrs. Scofield and McNamara, and also to the retiring officers.

The members of the association were very agreeably entertained by the Milwaukee jobbers and manufacturers, including the National Enameling & Stamping Company, J. P. Lindemann & Sons, Speich Stove Repair Company, Boehm Stove Repair Company, John Pritzlaff Hardware Company, Fuller & Warren Stove Company, Gueder & Paeschke Mfg. Company and A. J. Lindemann & Hoverson Company.

Among the souvenirs distributed was a nickel plated match box from the Estate of P. D. Beckwith of Dowagiac, Mich.; a thermometer by the Brand Stove Company and a celluloid grip tag by the L. J. Mueller Furnace Company.

The Royal Vegetable Masher.

The accompanying illustration represents a vegetable masher offered to the trade by William G. Browne, Kingston, N. Y., and shows the bottom of the masher blade. This is formed from a single piece of sheet metal, perforated and so bent as to leave downward projecting cutting edges which hold the vegetables in place while being cut, and at the same time force them through the narrow openings. The masher has all metal parts tinned, and is provided with an enameled handle.

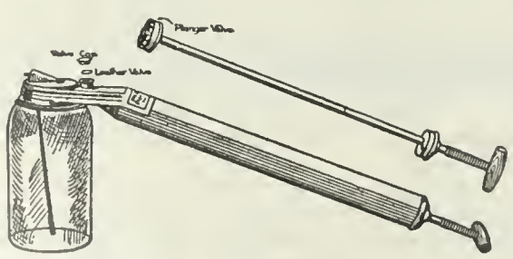


The Royal Vegetable Masher.

It is referred to as one which can be sold cheaply, as strong and easily cleaned, and as leaving the potato light, fluffy and free from lumps.

Rippley's Compressed Air Glass Jar Hand Sprayer.

The cut shown herewith represents a glass jar hand sprayer, improved for 1902, and offered to the trade by the Rippley Hardware Company, Grafton, Ill. The operation of the sprayer is described as follows: The air is forced into the reservoir by pumping, in the same way as with any sprayer. The reservoir has a brass discharge tube extending to the bottom and an air tube at the top, which allows the air to blow the solution out in the form of a continuous fog mist on all parts of the



Rippley's Compressed Air Glass Jar Hand Sprayer.

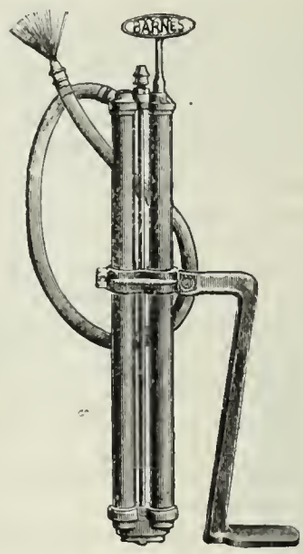
foliage. It is stated that it will spray in any position, including overhead. One filling of a 1-quart jar, it is explained, will spray 500 hills of potatoes, thus saving half of the usual time and labor. A 1 or 2 quart Mason glass jar will fit the sprayer. It is pointed out that nothing but the best material is used in the construction of the sprayer, and that leather washers are used on the jar, which are the best for use when spraying oily solutions.

Doorenbos Gas Arc Lamp.

The Sanitary Specialty Mfg. Company, 26 Milwaukee avenue, Chicago, are sole sales agents for the Doorenbos gas arc lamp, on which a patent was recently granted and which has therefore just been placed on the market. This is not a vapor lamp, but one adapted for the use of ordinary city gas, and is constructed on a principle which enables a much more brilliant light to be secured than by the ordinary methods. It competes with electric arc lights and is less expensive. It is made with one powerful central Bunsen burner, supplying a number of different mantles. This is stated to effect a saving of about one-third the gas required by a lamp having an individual Bunsen burner underneath each mantle. The lamp is made with an automatic inextinguishable pilot light. It is instantly lighted by pulling a chain and is extinguished in the same manner. This avoids the jarring of the mantles or the breaking of the chimneys whenever it is lighted. A guide prevents the mantels from being broken in removing or replacing the glass globe which incloses them. The exposed metal parts are highly finished and nickel plated, making this a very attractive lamp. It is especially adapted for lighting large rooms and stores.

Brass Bucket Spraying Pump, Fig. 254.

The accompanying cut represents a brass bucket spraying pump, Fig. 254, with malleable iron foot rest, offered by the Barnes Mfg. Company, Mansfield, Ohio. The pump is made of brass tubing without threads on either end, being held firmly together by a galvanized steel rod connected at the top and bottom parts, to make it perfectly tight. By removing the brass hexagon nut at the top of the rod the pump can be taken entirely



Brass Bucket Spraying Pump, Fig. 254.

apart, should it be necessary to repair or clean it. The manufacturers refer to the advantages in taking this pump apart, over pumps made of brazed tubing, with threads cut on the ends, to be screwed into the top and bottom castings. Another pump, catalogued Fig. 255, is the same as the one here described, except that it has a bucket clamp instead of the foot rest.

The annual convention of the Illinois Retail Hardware Dealers' Association was held on Wednesday and Thursday, February 12 and 13, at Decatur, Ill., with a large attendance.

The Central Hardware Company of Waco, Texas, have been incorporated, with a capital stock of $20,000, by L. F. Woody, B. F. Quicksail, R. P. Goodman and others. They will conduct a retail Hardware, Stove and Tinware business.

Leo Schlesinger & Co. have leased for a term of years a block on the east side of Gouverneur slip, between South and Front streets, New York City, now occupied by a group of five-story buildings. These buildings will be remodeled into a large Tinware factory.

"Underwriting" Profits.

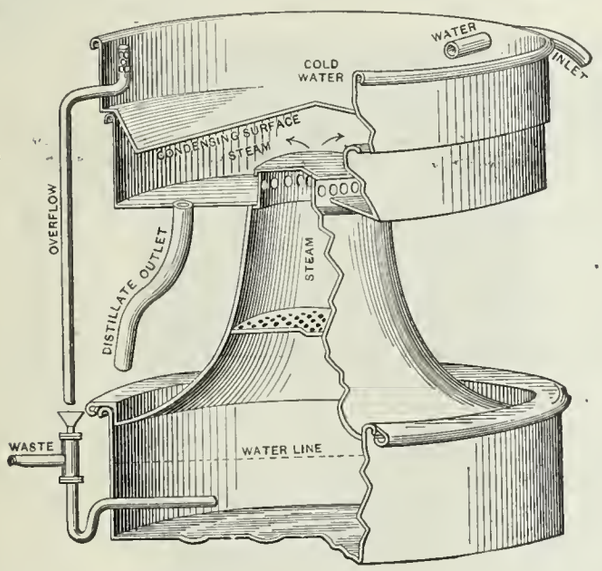
A good deal of figuring has been indulged in since the issue of the report of the United States Steel Corporation to get approximately at the profits which the Morgan syndicate must have realized for "underwriting" the steel merger. The basis of these calculations is the fact as announced that the syndicate received 649,987 shares of preferred stock and 649,988 shares of common stock of the Corporation. The usual valuation taken is 90 for the preferred and 40 for the common stock, or say $84,500,000, which is probably high. This high valuation is partially balanced by the fact that the syndicate received the dividends on such stock as it happened to hold at the time. The syndicate underwrote $200,000,000, but only $25,000,000 was paid in, no other calls having been made. The syndicate paid to the Corporation $25,000,000 in cash, and it is estimated that the other expenses were $3,000,000. This would bear a net profit of over $56,500,000. The *Evening Post* says:

Against this net profit, accruing to the syndicate, J. P. Morgan & Co. are understood to make a charge of 20 per cent. for their services as managers of the syndicate, or $11,300,000, leaving $45,000,000 as the apparent divisible profit to the syndicate, and J. P. Morgan & Co. were, of course, the largest individual subscribers.

In Wall Street the profits of an underwriting syndicate are usually reckoned on the total sum for which the members are liable. Thus, the steel syndicate profits are, roughly, 22½ per cent. on the subscription of $200,000,000. On the amount paid in the profit is 180 per cent. Probably J. P. Morgan & Co., assuming that they subscribed $50,000,000 to the syndicate, made a profit of $25,000,000 on the Steel Trust underwriting. The bankers' syndicate which underwrote the steel issues will, in short, clear the largest profit ever made on an undertaking of that kind in this country.

The McKenna Automatic Water Still.

The automatic water still designed and manufactured by the McKenna Bros. Brass Company of Pittsburgh is intended for use in chemical laboratories, and also for furnishing pure water for domestic use. The



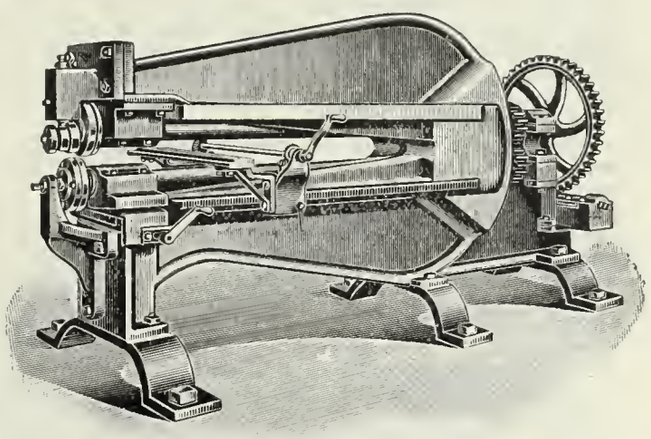
The McKenna Automatic Water Still.

construction of the still will be understood from the engraving, in which a part has been broken away to show the interior. To operate the still, it is placed on a tripod over a Bunsen burner or other suitable source of heat. The water inlet in the top pan is connected by rubber tubing to the water supply and water allowed to run in continuously. When the water reaches the level of the holes in the overflow pipe it runs into the funnel shown at the side and then into the lower pan until this is filled to the level of the small waste pipe shown at the side of the tee. The waste cannot rise higher than this level in the lower pan, since the excess of water is carried off by the waste pipe, which is connected by rubber tubing to the sink. When the gas is lighted steam is formed in the lower pan and rises through the central throat into the condensing chamber, passing through the baffle plate shown in the lower part of the throat and entering the condensing chamber through a ring of small holes about ½ inch above the bottom of the condensing chamber. The steam, striking on the upper surface of the chamber, which is kept cool by the running water, is instantly condensed, and drops to the bottom of the chamber as chemically pure water, whence it runs out through the distillate outlet, which is made of block tin pipe, into a suitable receptacle. As the water boils away from the lower pan, it is automatically replenished, so that the level is kept at the same point and no attention is required.

The still is 11 inches in diameter and 13 inches high. Over a burner using 10 cubic feet of gas an hour it will deliver 3 quarts an hour. It is made of heavy copper spun into shape with no soldered seams. All parts of the still are easily accessible for examination; by lifting off the top pan and then the condensing chamber, which is made in one piece with the central throat, every part of the still is in plain view.

The Ham Rotary Shears.

The rotary shearing machine built by L. M. Ham & Co. of Boston will cut, centrally, wrought iron or steel sheets 10 feet wide, up to ½ inch thick. The cutters are



The Ham Rotary Shears.

so supported on their shafts as to withstand the heaviest strain, and yet they may be readily removed for sharpening. They are vertically adjustable to act on varying thicknesses of metal, and means are provided for resisting the endwise thrust of the shafts tending to separate the cutters laterally. The machine has an adjustable gauge for regulating the width of the strip cut from the plate, and also an attachment for preventing the plate from being tipped up by the cutting pressure or retarded in its movement through the cutters. Power is applied through a worm gear and suitable reducing gears.

Dr. S. Rideal, in a paper read before the British Association at Glasgow, Scotland, put forth the statement that, when properly employed, sulphuric acid is a sure antidote to typhoid fever. During last year's alarming outbreak of enteric fever among the British troops in South Africa Dr. Parker of Chelsea, London, and himself began to make experiments, with a view of finding some chemical salt which would kill the typhoid germs in the infected water, and could also be added to that water by the soldier on the march. Such a salt they claim to have discovered in acid sulphate of soda, which, when added in the proportion of 1 gram (15 grains) to the pint, completely sterilized the water in a quarter of an hour. It was also found out that sulphuric acid added in the proportion of 4 grams to the gallon rendered sewage or drainage waters from isolation hospitals free from the typhoid organism.

THE PLUMBING BUSINESS—SOME SUGGESTIONS AND CRITICISMS.*

As manager of water works properties and also as owner of plumbing and heating business I have had 12 years' experience with master plumbers and journeymen plumbers. You may consider my remarks unbecoming to one who is actively engaged in the plumbing and heating business, but I hold that it is proper for us to criticise the manner and method of conducting this business.

I have heard the plumber accused of a peculiar pedigree—namely, sired by a natioual association and damned by the suffering public—yet I kuow that under the most favorable conditions our business is a difficult undertakiug. When you compare the many who fail to the few who succeed it reqnires nerve to place your money in this business. It is enough to make one serious to see man after man lose his last dollar while apparently laboriug hard to win out. Trying to analyze the cause of so many failures has given me materlal for my remarks.

A day does not pass without your ear being tickled with some remark about the immeuse profits of the plumber, but as I face an association comprising 95 per cent. of the master plumbers of Kansas I see no diamonds upon your honest breasts. Few of us own tbe place of busiuess we occupy or the house in which we live; many of us do business upon borrowed capital. When we realize what a small amount of money actually sticks to our fingers, although large sums are handled by us, there must certainly be something wrong, and I have come to the conclusion that it proves a lack of busluess ability.

I sometimes think we have been bypnotized by the oft repeated accusation of making a large percentage and actually lose sight of the principal. A man cannot succeed at this business unless it is conducted upon busluess principles. I can show you plumbing shops that look like opium deus and plumbers' books that look like a Chinese laundryman's accounts. Such combinations cannot win iu this business. When a man seeks a plumber he does not want to be required to go into a second-hand joint or junk shop. Do not reqnire your customers to don jumpers and overalls to protect their clothing wheu they come to your place of business.

The display room of a plumbing shop should be as neat as a dry goods store. You cannot make prospective customers believe that you can sell cheap because your goods are dusty aud fly specked and your windows and ceilings are cloudy. On the contrary, such an appearance is properly construed to mean old fashioned, uu sanitary fixtures. We can profit much by observing how other lines of business are conducted. If it pays the clothlug merchaut to dress his windows it will also pay the plumber. It does not make any difference how small the shop may be or limited the capital, it is a good investment to always keep a tidy place. Some master plumbers seem afraid to own the goods they are offering for sale; at least they do not have confidence enough to invest in a creditable display of stock.

The day of hunting up a customer with a catalogue and trying to sell plumbing fixtures by showing pictnres is past. The man who can show the goods aud thereby prove his ability to complete a contract within a specified time will get the good cash business. It is always a safe investment to have the fixtures for a complete bathroom on display, and it is as essential as the sign over your door. The more complete and diversified the stock the greater the opportunity for making sales and securing contracts. It is well to remember that loss and shrinkage in value is only to be found in cheap stuff. Ask your customer to come to see your display, and the best way to do so is through the newspapers. A man, if not ashamed of his business, should give public notice of where he can be found and what he is doing. If yon put in a good bathroom your customer will have no objection if you give publicity to the matter through the newspapers. In fact, he will be pleased to learn that you are informing his friends of the fact that he has modern plumbing in his home.

Master plumbers often make a mistake in being careless in keeping tbeir books and accounts. If you cannot do the book work promptly and properly it will prove a good investment to employ a competent bookkeeper. A good acquisition to any plumbing shop is a girl with a typewriter; it insnres legible letters, intelligent accounts and a neat office. It also tempers the wrath and subdues the profanity of your irate customer when he calls to settle his bill.

It never pays to send out a crude statement. The customer is liable to jump at the conclusion that the material and labor furnished him were on the same order. The plumber should mail his customer a statement the moment the work is completed, whether it is contract or jobbing work. It is business, he is entitled to it, and when you call to see him the first of the month he canuot plead that he has not had an opportunity to check it over. Try this plan and see if payments are not made more promptly. The jobbing house and manufacturer mail you a statement immediately upon the shipment of your order, and it is only business for the plumber to do the same.

We must understand once for all that old methods are obsolete. Master plumbers must adjust themselves to changed conditions. Business must be done on a closer margin and profits must depend upon the volume of busiuess done. Let us get in line with the times and modern, up to date methods. Master plumbers must take more pride iu their business. They must identify themselves witb the welfare of their city. They should belong to commercial organizations and contribute time, ability and money toward advancing the interests of their city, and the knowledge, experience and acquaintance thus gained will return liberal dividends. The master plumber should so interest himself in the upbuilding of his city that he will be recognized as engaged in an honorable and creditable business. To be engaged in this business does not absolve a man from the duty he owes as a good citizen of contributing his share toward upbuilding his city or participatiug with political, benevoleut and charitable associations for the betterment of his fellow man. A plumber has no right to be a hanger ou. He should work for and advocate those thiugs that will make his city more prosperous and a better place in which to live.

Let us practice what we teach by equipping our homes with modern sanitary fixtures. The master plumber who has no bathtub in his home or does not use a bathtub frequently should not be permitted to sell sanitary fixtures.

In conclusion I desire to congratulate the plumbers of Kansas upon the many signs of improvement in our busiuess that can be seen throughout the State. The general prosperity of the State has been felt by us, but how much of our success is due to the vigilant work of our officers, who, backed by nearly every plumber in Kansas, have been able to protect our rights and interests. Let us renew our pledge to stand firmly by the regulations of our associatiou and comply strictly and honorably with its reqnirements and obligations.

*Paper read by John Bishop at the Convention of the Kansas Master Plumbers' Association.

ARRANGEMENT OF SUPPLY PIPES OVER SINKS.

BY HELMAR.

Considerable skill is often necessary to arrauge sink supplies and air chambers so as to get the best results, because no place in the ordinary job is better for the stop and waste cocks which control the bathroom supplies

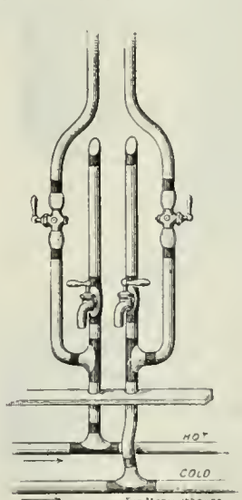


Fig. 1.— Faucets and Air Chambers on Direct Supply Pipe.

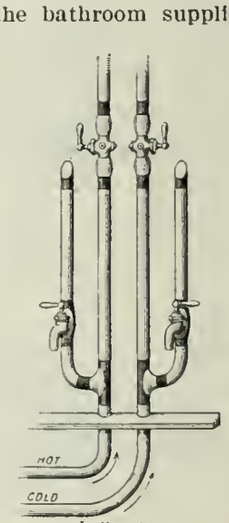


Fig. 2.—Faucets and Air Chambers on Branches.

Arrangement of Supply Pipes Over Sinks.

thau over the sink. Three plans are shown in the accompauying sketches, each of which has its merits. The cold faucets should always be on the right-hand side. The hot supply should always be the upper pipe of the horizontal "runs." When there is uo circulating pipe, if the sink is only moderate size and the pressure uot extra high, the faucets should be placed ou the direct lines.

as shown in Fig. 1, have good air chambers, and the bath room branches taken out on the outside. This throws the concussion directly on the air chambers at the two faucets most used. Furthermore, the faucets are close enough together to let both flow into a small vessel at once.

If the pressure is extremely high place the sink faucets on branch pipes taken out inside the direct lines, or outside, as shown by Fig. 2, as conditions may require. When on the outside faucets are too far apart to draw

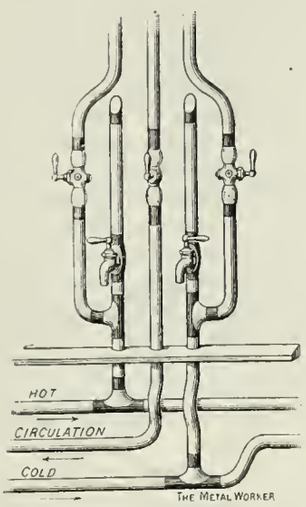


Fig. 3.—Faucets and Air Chambers as Arranged on a Circulating System.

from both at once into any but a large vessel, but the direct lines are free, and a filter may be very easily branched into the cold supply pipe, between them, over the sink, at any time, at the least possible expense. All other faucets must be well provided with air chambers when the sink faucets are on branch pipes, especially on extra high pressure work.

A circulating job requires three lines, and the circulating pipe is almost without exception carried between the hot and cold lines, thus bringing its stop and waste and the one on the hot supply side by side. Both these stops must always be turned at the same time, both waste, and they should be together so that neither will be forgotten. The sink faucets of circulation jobs are nearly always placed on the direct lines, as shown in Fig. 3, and should have extra long air chambers if the pressure is high. They may be placed on branch pipes, but this throws the direct lines very far apart, and the branch pipes for them must be taken out on the inside to avoid having the faucets even further apart than when they are on branch pipes taken from the outside of the lines of a plain job. Bulb air chambers are sometimes used on circulating jobs, but, as the sink in such jobs is usually large, and the chambers must go below the stop cocks, the cocks are then too high for convenience. Branch pipes may be taken out below the sink, but this takes more pipe and cuts the capping in too many places.

Large Fan for Mechanical Draft.

The American Blower Company of Detroit, Mich., recently produced a fan of unusual dimensions to be used in a mechanical draft installation. It is intended for producing forced draft in a boiler plant of 10,000 horsepower, and does away with the use of a chimney. The fan will be used in connection with Roney stokers, the fuel employed being anthracite buckwheat No. 2. It has a wheel 18 feet in diameter, inclosed in a housing constructed of steel plate and beams, standing 30 feet high. The accompanying half-tone shows this fan in course of construction in the new shop recently completed by the company for the special manufacture of this apparatus.

New York City Notes.

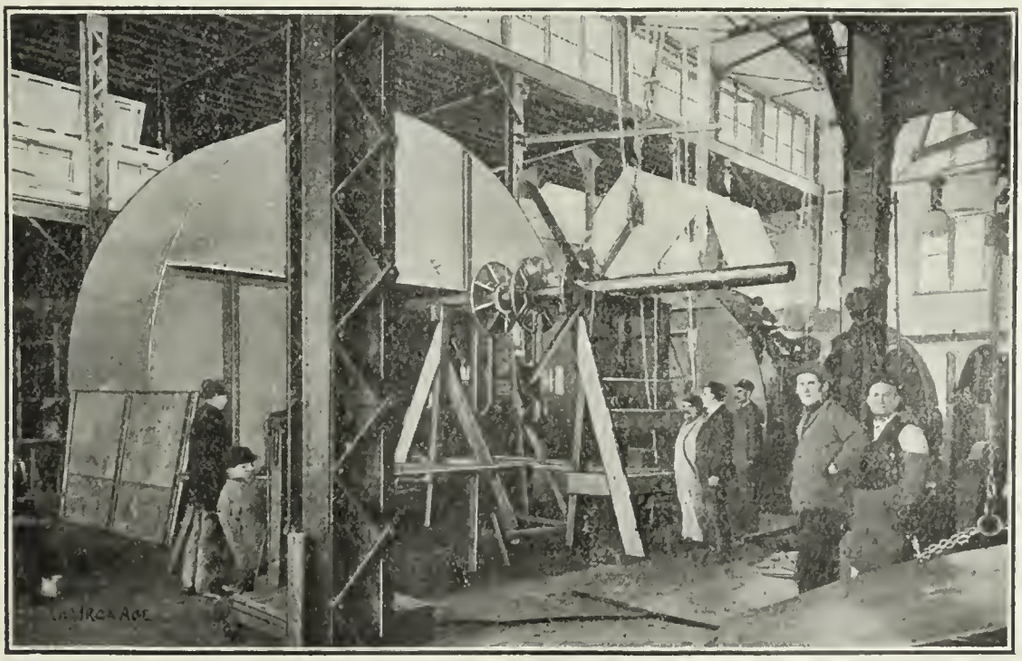
Trade still continues quiet, many journeymen being out of work. The only busy shops are mostly those with large contracts which have been going on for some time.

* * *

Charles Hensle seems to have the knack of keeping busy on fine work. His latest job is a row of houses for Sonn Bros., at 306 to 314 West Ninety-ninth street, which work is ready to go in on at once. He also has jobs at Ninety-fourth and Ninety-seventh streets, near Riverside Drive, which are not yet ready.

* * *

The differences existing between the Amalgamated Society and the United Brotherhood of Journeymen Plumbers and Gas Fitters seem now to be on a good road to settlement by the two organizations uniting as Local No. 2. A probable agreement with the Masters' Association will be one of the results accomplished, together with doing away with strikes, entailing loss of time and money, such as have occurred during the past three years.



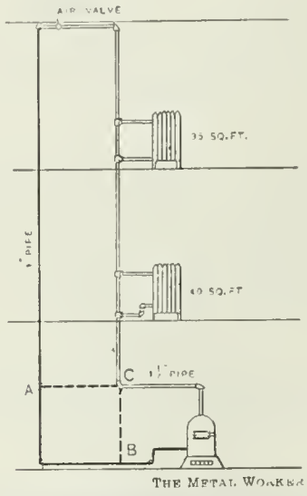
Large Fan for Mechanical Draft.

T. W. Corbett, New Haven, Conn., is heating and plumbing the new parish house of Christ Church, in that city.

WHY THE BOILER WAS CONDEMNED.

BY MANUFACTURER.

A few months ago I read an article in *The Metal Worker* in reference to faults in boilers that were brought to the attention of manufacturers. An experience of this kind having just come under my notice, I think that some interest might be taken in a brief account of it. A small heater of the type known as tank heater was sold to a customer, and in a few weeks the complaint was registered that the boiler was no good and would not heat. No satisfaction could be secured from questioning the customer on the details of piping, &c., and it was necessary to go to the expense of sending a man to see what was the trouble. On investigation he found the piping system in connection with the boiler to be as shown herewith, the boiler being used to heat two small radiators of 40 and 35 square feet of surface. A 1½-inch flow pipe was taken from the heater and carried over to a point where a riser was taken up to supply the two radiators, and then, instead of a return pipe being brought back from the two radiators and thereby saving piping and insuring satisfactory operation, the method as shown in the sketch was followed. A 1-inch pipe was carried up to the ceiling of the second floor and run over to the wall, where the 1-inch pipe



Why the Boiler Was Condemned.

dropped, behind the lath and plaster, to the cellar, where it was carried to the boiler. It is not difficult to see why the radiators would not heat, to say nothing of the foolishness of making the return smaller than the flow pipe in a hot water system.

Notwithstanding that the trouble was due to the ignorance of our customer, we were expected to devise some means of aiding him to get out of his difficulty at the lowest cost. We advised him to cut out the pipe from A to B and disconnect the pipe at C, so that the flow main could be carried from the top of the boiler over to A and connected with the 1-inch pipe. The return was then connected with the old flow riser and carried down to B. By this means hot water from the boiler flowed across the building to A, where it rose in the 1-inch pipe behind the lath and plaster to the top of the building, and, on slightly cooling, fell through the two radiators. While this remedy does not change the job from a botch, it nevertheless does enable our customer to afford a more satisfactory service to the owner of the plant. It is quite probable now that should anybody in the trade run across this piece of work they would be informed that it was designed by one of our men, so that, in addition to having one of our boilers set under a handicap so that it cannot give the owner the satisfaction that it is capable of, we also enjoy a reputation for designing a piece of work which would cause our office boy to be discharged if he was guilty of such an outrage on common sense in piping.

THE RED WING SEWER PIPE COMPANY'S old plant at Red Wing, Minn., was destroyed by fire February 7, entailing a loss of from $75,000 to $100,000, with insurance of $50,000. The loss includes valuable machinery, patterns and dies.

STEAM FITTERS' CONVENTION.

In order to get the views of the members of the National Association of Master Plumbers and Hot Water Fitters as to the time and place for holding the next annual convention, Secretary Henry B. Gombers requests members to send in their preferences. Already the Eastern members have suggested to the Executive Committee that June 3, 4 and 5 would be a convenient time, and they have also suggested Atlantic City, N. J., as a place for holding the convention. This popular seaside resort could readily accommodate a large number, and if the convention was held at that place many members would be enabled to enjoy a short sojourn on the ocean front. There has been some talk that the National Association of Master Plumbers will hold their next convention in Atlantic City, and as the time and date have not yet been set it would be of some advantage to the membership of both associations if Atlantic City should be finally decided upon and dates arranged that would not conflict. Secretary Gombers also mentions that any amendments to the constitution must be placed in the hands of the Executive Committee at least ten days before the date of the opening of the convention if action is to be taken on them, in accordance with the laws of the association.

Resolutions on Death of John D. Clarke.

At a meeting of the Master Steam and Hot Water Fitters' Association of New York City, held on Tuesday, January 28, the following resolutions were unanimously adopted by a rising vote:

Whereas, The sudden death of our fellow member, John D. Clarke, in the fifty-fifth year of his age, has taken from us a man well and favorably known in the steam heating trade, therefore be it

Resolved, That we, the members of the Master Steam and Hot Water Fitters' Association of New York City, place on record our regret over the loss which came so unexpectedly; and be it further

Resolved, That in losing him we shall miss a genial companion of many years' standing, whose fellowship was sought by many; and be it further

Resolved, That this association tender its sympathy to the family of the deceased, and that these resolutions be entered upon the minutes of the association and published in the *Official Bulletin* of the National Association.

Transmural Ventilation.

In the year 1878, says the London *Telegraph*, Dr. Flugge proved that air will go through the walls of a closed room at a rate depending mainly on difference of temperature between the inside and the outside—the latter being the lower. With walls of ordinary thickness he found that about one-fourteenth of the air in the room would be changed per degree Centigrade per hour. In other words, if the outer were 14 degrees C. colder than the inner, the air of the room would be completely changed in an hour by transpiration through the walls. M. H. Wolpert has re-examined this subject, and he finds that in a chamber of 60 cubic yards capacity, having walls of masonry covered with paper, the air will be changed at the rate of one-fortieth of its volume per degree Centigrade per hour. When the paper on the walls contained oil varnish decidedly less air permeated, while without paper at all much more went through. It is desirable, therefore, that the exterior of houses should be clean, and a heavy rain is a blessing in this respect. Also it follows that the greater the difference between inside and outside warmth the more copious this spontaneous ventilation. Pettenkofer found that when materials like slag and glass were used, through which air could not pass, the cements employed were, as a rule, highly permeable.

ASSOCIATION NEWS.

New York City Master Plumbers.

The Executive Committee of the Association of Master Plumbers of the City of New York held their annual meeting in the rooms of Manhattan Branch, on Monday, February 10. The reports of officers and committees showed a great deal of work done and good accomplished, and that the various branches composing the association were in good shape. The result of the election showed that the organization was thoroughly satisfied with its executive head, Isaac J. Brown being elected president for the third time. The other officers were mostly re-elected, the list being as follows:

President, Isaac J. Brown, Manhattan.
First Vice-President, Edward Macdonald, Brooklyn.
Second Vice-President, J. A. Rossman, Manhattan.
Treasurer, B. F. Donohoe, Manhattan.
Secretary, T. A. Hill, Manhattan.
Sergeant-at-Arms, W. M. Brown, Brooklyn.

Treasurer Donohoe holds the banner for office holding, as this is his fifth term.

Bridgeport Master Plumbers.

At the recent annual meeting of the Master Plumbers' Association of Bridgeport, Coun., the following officers were elected for the ensuing year:

President, John T. Brady.
Vice-President, F. C. Booth.
Treasurer, L. H. Mills.
Secretary, W. D. Kelsey.
Sergeant-at-Arms, H. B. Middlebrook.

St. Catharines Master Plumbers.

The master plumbers and steam fitters of St. Catharines, Ontario, Canada, met on February 3 and formed an association of master plumbers and steam fitters, which is to be affiliated with the Dominion Association of Master Plumbers. The following officers were elected for the ensuing year:

President, Albert Chatfield.
Vice-President, Andrew Riddell.
Secretary and Treasurer, Theodore Parnell.
Master-at-Arms, Charles Hoople.

The Master Plumbers' Association of Boston, Mass., gave their twentieth annual ball in Berkeley Hall last Thursday evening, there being about 400 in attendance. The Floor Committee consisted of Daniel Shannon, J. W. French and T. J. Tute. Among the guests present were Capt. John S. Damrell, Michael J. Fitzsimmons, Richard Lynch, William Donovan, Robert Godfery and James Heatherton.

The Calorific Heater & Mfg. Company.

James Walp, William A. Walp and Lewis C. Wilson of Easton, Pa., recently spent the day in Allentown, Pa., in company with S. N. Lehr and W. H. Gangawere of that city, where they purchased 4 acres of land in South Allentown for the erection of seven buildings, which will be occupied by the Calorific Heater & Mfg. Company for making the Calorific steam and hot water heaters. The machine shop is to be 50 x 140 feet, the foundry 40 x 100 feet, with suitable buildings for the cleaning and testing room, engine and boiler room, pattern storage house, coke sheds, core ovens and office. The company have been manufacturing the Calorific steam and hot water heaters for several years, and they have gained a good reputation and established a considerable demand for these goods. Heretofore the company have been hampered in the production by having their office in Easton and their manufacturing plants at Tatamy, Pa., and Phillipsburg, N. J. The new plant will enable them to produce their goods more expeditiously and economically.

Field & Shorb have the contract for heating the St. John's Episcopal Church, at Decatur, Ill.

The Foster Steam Specialties.

The Foster Engineering Company, Newark, N. J., are sending out their 1902 catalogue, consisting of 96 pages, devoted to the Foster regulator or reducing valve and other high grade specialties for use in connection with steam, water, gas, or air. The catalogue is handsomely printed and illustrated with excellent half-tone engravings, the first giving a general view of their plant. A page is devoted to a view of the company's new plant, which is said to have many times greater producing capacity than their old plant. This is followed by an excellent view in the testing room. Under the head of "Facts Worth Knowing about Pressure Regulators and Kindred Devices," useful information is given in reference to the quality and character of valves which some of the great engineering plants are using, and their adaptability for compressed air plants and for shipbuilding is pointed out; also that they are the United States Navy standard. This preliminary matter, occupying several pages, closes with an invitation to write the house whenever needing information in reference to valves.

The next section is divided into 13 parts, giving information for saving time and money when ordering goods. The Foster regulator of Class W has the first place in the catalogue and is shown by means of a fine half-tone engraving and excellent sectional drawings lettered, so that the explanation in detail gives full information in reference to the construction and operation. The same general character of information and illustration is presented in the Foster improved diaphragm, strainer and toggle levers and springs. The Class Q regulator, pump governors, engine regulators, back pressure valves, relief or free exhaust valves, non-return stop valves, with angle or straight way bodies, combination steam actuated valves for emergencies, hand stop valves and pilot valves form another section of the catalogue. The Foster device for controlling the speed of pumps or engines is also shown and described. The Foster Class W regulator is also shown as a pump regulator actuated by water discharge pressure and actuated by steam and discharge pressure. This is followed by the Foster automatic pump stop and combination regulator. Foster's Excelsior valve No. 7 automatic safety stop valve, float valves, automatic belt shifter, automatic relief valve, high pressure reducing valve and the Class W pressure regulator for steam heating on frames close the line of goods shown in the catalogue. Instructions are given how to apply and use the Foster regulator, divided into 14 heads, with diagrams showing the various positions in which the valve may be set. The catalogue also contains a table of dimensions and a private code for ordering goods or repairs. This code occupies five pages and is followed by a well arranged index.

The P. and S. S. League.

The main contest in the bowling tournament of the Plumbing and Steam Supply League in New York on Monday night was in the last game between the Ronalds & Johnson Company's Brooklyn team and the team of F. N. Du Bois & Co., the latter team winning by a score of 788 to 769. They also won two games for the evening while the former team won and lost. The team of John A. Murray lost two games and completed their schedule, joining in the tail end tie with the teams of E. F. Keating and Thomas G. Knight. These three teams are waiting to welcome the team of F. Adee & Co., which has two games to bowl.

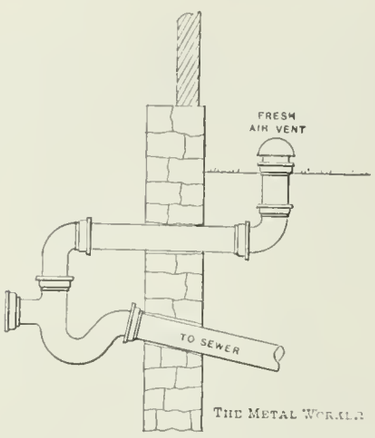
The contest of the whole tournament in which the most interest was centered took place Thursday night, when the Behrer Family team had to win two games to tie the John Simmons Company's team for first place. They also had to beat the team of the Crane Company, who also had a chance to tie the leading team. The H. P. Read Lead Works' team lost two games, the first to the team of Behrer & Co., the score being 574 to 748, and the second to the Crane Company team; score, 601 to 805. Then came the fierce strife to tie the leader. When the smoke of the fray had cleared away it was found that the Behrers had down 823 pins to 822 by

their opponents. This was a worthy contest, as both teams held their front positions through skillful, consistent bowling, and their team averages will be at the top of the list. In the last game A. Behrer, Sr., scored 185; C. Behrer, 170, and M. Behrer, 169. For the Crane Company's team C. W. Grimshaw scored 202; G. A. Van Steenburg, 172, and A. E. Good, 156. When the regular schedule is completed the tie for first place between the teams of Behrer & Co. and the John Simmons Company will be decided on the alleys, when it is safe to expect a large and enthusiastic audience.

MAKING SEWER CONNECTIONS.

BY G. H. W.

The method of connecting house drains with sewers is one that has been widely discussed at different periods by those interested in the improvement of plumb-



Making Sewer Connections.—Fig. 1.—A Customary Arrangement.

ing. In this little section of Rhode Island two methods of making sewer connections are adopted. That shown in Fig. 1 follows in principle the custom which has quite generally been adopted in various parts of the country. In this instance the running or intercepting trap is placed inside of the cellar or front wall. The fresh air inlet and foul air outlet, as it should properly be called, is connected with what would ordinarily be termed the hand hole or clean out opening of the trap, and is carried to some point outside of the building, generally located at least 6 feet from any door or window. The upper end of this vent is usually protected by a cap.

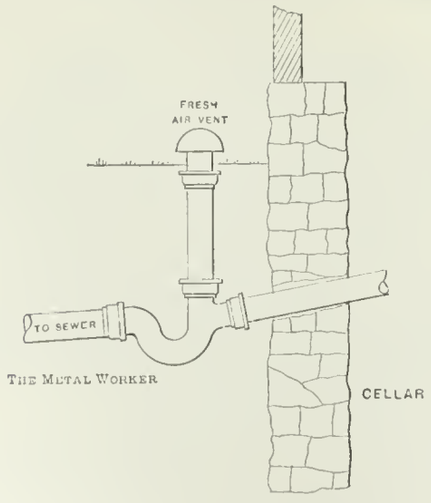


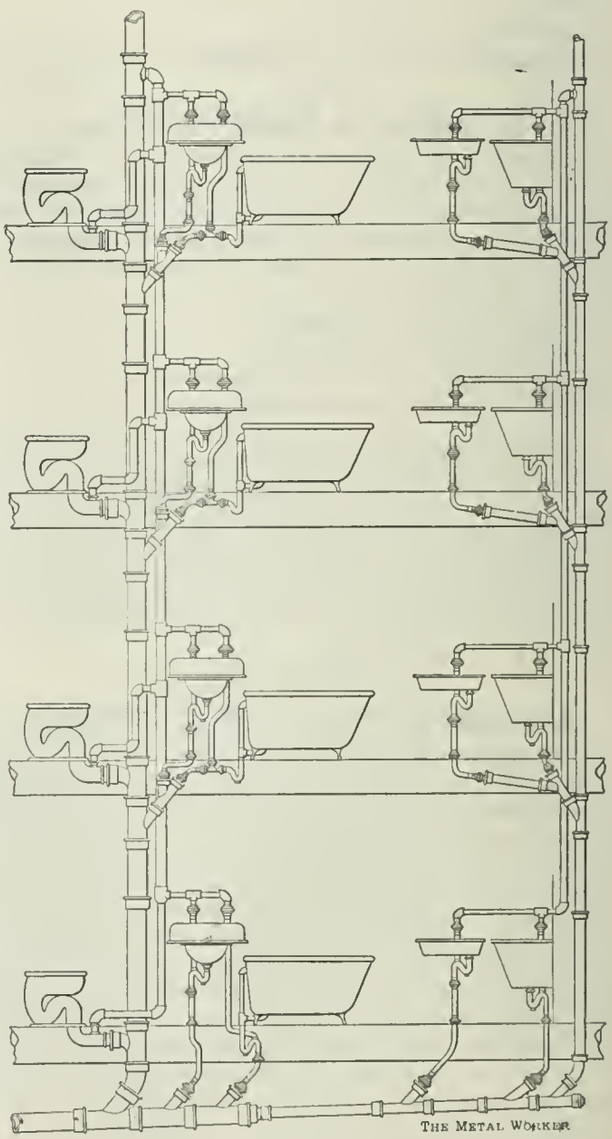
Fig. 2.—Trap Outside the Building.

A method that is sometimes used is shown in Fig. 2, where the intercepting trap is located outside of the building. The argument in favor of this location is that should the sewer air break the seal of the trap from pressure in the sewers, due to back water compressing the air in them, and bubble through the trap seal, this air could readily escape through the fresh air inlet located as shown. Of course the same may be said of the connection shown in Fig. 1, but the necessary turns in the vent pipe will not allow the sewer air to escape as readily as the direct pipe shown in Fig. 2.

I have said that this vent pipe should also be called a foul air inlet. I appreciate that under most conditions the warmth of the building is sufficient to induce an inflow of fresh air through this pipe which passes through the entire drainage system, and escapes through the vent pipes, when they are carried through the roof. There is another period of time, however, when the filthy air in the drainage system is forced out through this pipe, when a fixture is discharged, and the swirl of the water running through the vertical and horizontal waste pipes forces the air ahead of the flush and out of the pipe. This is recognized to the extent that in many cities the law provides that the outer end of this vent pipe must be so located that the odors that attend the discharge of the air from it when a fixture is flushed cannot be a nuisance, and requires that it be at some distance from a window or door.

Anderson Sanitary Couplings.

The success that has attended the use of the Anderson lead pipe coupling for street service pipe made by the Anderson Coupling Company of Portland, Conn., has led to the demand for a coupling adapted for sanitary work. In the accompanying illustration is pre-



Anderson Sanitary Couplings.

sented an elevation of a plumbing system in an apartment house in which the Anderson lead pipe coupling is used for connecting to lead piping, showing how the work may be done without the need of a wiped joint. The pipes are arranged in accordance with the most approved plumbing regulations, and show that with these

couplings, which are especially made for sanitary work, a plumbing system can be erected by any one who is familiar with the great necessity of arranging the pipes properly, so that sewer air cannot possibly find its entrance to the building, and that the waste, flushing water and condensation may find their way properly to the sewer and a circulation of air take place in the piping, to dilute or destroy what otherwise might be harmful. The company issue a catalogue showing the various styles of fittings which they manufacture for this work, and the tools for working the lead pipe so that the couplings can be used. They invite correspondence, and are prepared to render assistance to all who may desire instruction. Their little pamphlet "Don't" is devoted entirely to the coupling designed for making a street service connection.

"The Plumbing Trade Conspiracy."

The above heading, which is given to an editorial in the New York *Times*, seems to be a reflection of the view taken by the public of the efforts of the association plumber to enforce his view of trade protection. Items of news about suits of a kindred character to those referred to have been presented in the newspapers frequently; but for so prominent a paper as the *Times* to take up the subject editorially is evidence that an interest in it is being awakened on the part of the public that can result in no benefit to the trade, and which would suggest the advisability of a less radical course than that which is being pursued by plumbers in some sections of the country. The editorial in question is as follows:

The plumbers of at least two States are learning from disagreeable experience that to maintain a conspiracy in restraint of trade, with high handed rules framed to drive from the business all who do not conform to the regulations prescribed by the National Association of Master Plumbers, is dangerous even if profitable. One batch of Texas master plumbers was lately rounded up on indictments for violation of the anti-trust law involving aggregate penalties of $56,550,000, and most of them confessed judgment and withdrew from the association. It is not reported that they have yet paid the judgments. A second round up has just taken place at Austin, with a large number of defendants. The penalties claimed under the statute against 21 of them already amount to $40,950,000, and are increasing at the rate of something over $100,000 a day. The plumbing business has been understood to be profitable to those who engage in it under favorable conditions, but scarcely profitable enough to warrant the risk of such magnificent penalties as the Texas law imposes. In the first Texas case a local association was made defendant. In the suit just begun at Austin individual members are separately impleaded and stand charged with violating the anti-trust law of the State by forming and entering into a combination to restrict competition. This procedure is strictly in accordance with the decision lately handed down by Judge Morris, in the case of the State of Texas against the Shippers' Compress & Warehouse Company, to the effect that a corporation could not be held to be a violator of the law, but that each member who enters into such corporation and forms a part of it is guilty of such violation when it occurs. This would seem to be an odd ruling, but the Texas anti-trust law is an odd law, and probably the distinguished jurist whom we have quoted interprets it correctly.

In Ohio the anti-trust law has been invoked by one John A. Smith, who has instituted a suit against the Akron Master Plumbers' Association, charging that the association is organized for purposes at variance with said law and citing injuries for which he claims damages in $22,500. As the Ohio law provides that double the amount of damages proved may be collected, the defendants are really confronted with a $45,000 damage suit. The petitioner alleges that because he is not a member of the Akron Master Plumbers' Association he has been unable to buy goods from those making the kind of goods suitable for his trade, and has been put to great inconvenience and loss in consequence; and he promises to produce letters by the pound from firms who have refused his orders on the ground that they did not dare to sell him because of the threat of the association to boycott those who violated its rules. As it is on exactly these lines that the master plumbers' associations have worked, it looks as if Smith had a good case. Indeed, it is surprising that they have not before been made defendants in conspiracy suits. In no trade has the principle of the laws defining public policy in such matters been so openly defied as by the plumbers, and that retribution has overtaken them will probably not occasion widespread unhappiness outside the associations which have had things their own way for a good many years.

Heating and Plumbing Notes.

THE members of the Plumbing Board of Washington, D. C., have written to the District Commissioners, asking them to request Congress for the sum of $10,750 to pay for services rendered from July, 1893, to July, 1898. Col. John Biddell, the engineering commissioner, has submitted an adverse report on the request, stating that a former report of this board mentions that the plumbing board have received no salary, but have devoted their time and energy to the service, as a contribution to the cause of sound government and progressive sanitation.

G. H. SCHWAB, American representative of the North German Lloyd, proposes to inclose the West Thirty-forth street pier during the visit of Prince Henry of Prussia, and to equip it with a steam heating plant and an incandescent lighting system. The interior will be trimmed with flags, bunting and palms, bay and laurel trees.

THE GREASON MFG. COMPANY, 108 West Ninety-ninth street, New York, are attracting attention to their Galvanized Sheet Iron Wash Tray Covers by using them as sides on their delivery wagons, in this way bringing them to the attention of their many customers in the plumbing trade in New York City when delivering goods, besides showing them conspicuously to the public as the wagons pass through the streets.

A STRIKE in the plumbing trade at Memphis, Tenn., has resulted in the bringing in of journeymen plumbers from the outside to do work in that city.

GEORGE H. BEASLEY, North Easton, Mass., has moved his plumbing business from Beasley's Block to Washington street.

THE TIRRELL GAS MACHINE COMPANY, 39 Dey street, New York City, are finding a good demand throughout New England for their Gas Lighting Apparatus for suburban residences.

THE HARTFORD BLOWER COMPANY, Hartford, Conn., have the contract for installing a complete blower system for removing dust from the new building of the Bemis & Call Hardware & Tool Company, Springfield, Mass.

SHUMWAY & RILEY, Northampton, Mass., have the contract for the plumbing work in two brick buildings to be erected for the Florence Mfg. Company in that place.

THE HART & COOLEY COMPANY, New Britain, Conn., manufacturers of Steel Register Plates, are forced to run their plant at night to keep up with orders.

FRANK G. FAULKNER, who was well known to the wholesale plumbing trade of New York, died of pneumonia at his residence, 164 Lafayette avenue, Brooklyn, on February 5, aged 56 years. For the past seven years Mr. Faulkner had been with the John Simmons Company, 108 Centre street, who are sending to his many friends in the trade, with their sincere regrets, an announcement of his death. Mr. Faulkner is survived by his widow and one daughter.

E. J. ROHRBACK & BROTHERS, Topton, Pa., are installing a steam heating plant in the Trinity Evangelical Lutheran Church, at Bowers.

H. P. WESLEY, High street, Holyoke, Mass., has been remodeling the plumbing in the residence of Dr. L. L. Clark, and has completed what is said to be a fine piece of work.

THE waste of water through the medium of leaky faucets or defective joints in house service pipes is an important item to water companies, not only in places where a flat rate prevails, but where meters are used, as in the latter case it results in numerous claims of overcharge on the part of consumers. A little device known as the Waterphone, and sold by E. J. Hussey & Co., 80 John street, New York, will reveal any such waste by placing the end of the Waterphone against the pipe, when the flow or drip in any part of a building or street is instantly heard.

THE AMERICAN STEAM GAUGE & VALVE COMPANY,

Boston, Mass., are sending out a doubly useful calendar. Those who use it will find it a convenience owing to the large figures on the date tablets, while the company expect the pictures of a battle ship and an express train on the card to attract substantial attention to the fact that the high grade Ganges and Valves displayed below are used on such important mechanical perfections.

A CIRCULAR giving the price-list of the Nonpareil Cork Protection Covering for frost prooling water pipes is being distrlbuted by J. H. Edwards, 59 Park place, New York. This Covering is made to cover pipes from ½ to 6 inches in diameter. The price-list gives the price for Special Coverings for ells, tees, globe valves and crosses, and also weight of the material per lineal foot. Other information in reference to frost proof piping is also given.

W. AL. LAFFIN, who for the past 17 years has been connected with the Thatcher Furnace Company, has opened an office at 101 Beekman street, New York, as a heating and ventilating engineer. Mr. Laffin will make a specialty of Furnace heating and steam and hot water fitting, and will give some attention to Range work. He is prepared to do the sheet metal work in connection with all kinds of heating and ventilating systems.

THE UTAH PLUMBING SUPPLY COMPANY of Salt Lake City, Utah, have purchased a piece of ground, 65 x 165 feet, facing First South street, on which they propose to erect a two-story warehouse to enable them to accommodate the needs of their growing business.

St. George's Industrial Herald, published in the interests of the St. George's Trade School of New York City, reports that the plumbing class of the school this season has 15 boys on the roll. These pupils have been remarkably attentive and industrious, and have made satisfactory progress. The plumbing class seems to be one of the favorite departments in the school. Instructor Tucker takes a great deal of interest in the boys, and has succeeded in securing positions for a number of them, where they were able to make use of their school training. An attractive feature of the plumbing class room is the display of specimens of the work of the pupils, which are tastefully arranged on the walls.

JOSEPH BRONOLD, Buffalo, N. Y., bid $30,905 and secured the contract for heating and ventilating the Lafayette High School in that city.

C. EDWARD HANTZ, York, Pa., advises us that he has remodeled the building that he recently purchased in that city, and will occupy it with his plumbing and hot water heating and ventilating business.

H. B. SHERMAN MFG. COMPANY, Battle Creek, Mich., have recently purchased the Acme Brass Works of Elkhart, Ind., and removed their entire plant, consisting of machinery, patterns, stock, tools, &c., to Battle Creek, where it has been incorporated with their main plant. The company are now ready to quote prices on and furnish a full line of Automatic Couplings, Brass Hose Pipes, Steam and Common Couplings, Hose Nipples and other goods of this nature.

J. P. EUSTIS MFG. COMPANY, 96 North street, Boston, Mass., for whom Edward A. Grenzbach, 97 Chambers street, New York, is the representative in New York City territory, have issued catalogue D, entitled "The Brasscrafters," showing beautiful and complete assortments of Bathroom and Lavatory Accessories of cast and wrought brass, polished and nickeled. The company also manufacture special Brass and Bronze Statue, Structural and Grill Work.

THE plumbers of Rockford, Ill., have petitioned the City Council to pass an ordinance providing for the inspection of plumbing work done in the city.

EDWARD SCULL, senior member of the plumbing firm of Edward Scull & Co., 10 South Fifth street, Reading, Pa., died suddenly of heart failure at his residence, 48 South Fourth street, on February 5, aged 62 years. In 1857 he was apprenticed to the plumbing trade, but on the outbreak of the Civil War he entered the Ringgold Light Artillery for the defense of Washington. After being mustered out he enlisted in the Forty-second Pennsylvania Volunteers. In 1861 he married Catherine Call, who survives him with three children, one of whom is William O. Scull, a member of the firm.

New Firms and Changes.

E. H. HALL & SON have purchased the plumbing establishment, at Belchertown, Mass., formerly conducted by L. E. Ballou.

THE ENGINEERS' & PLUMBERS' SUPPLY COMPANY of Columbus, Ohio, have been incorporated, with a capital stock of $25,000, by James Westwater, F. M. Rine, Thomas Murnane, W. G. Westwater and Joseph McCue.

HENRY ASHLAND has sold out his plumbing business, at Red Lodge, Mont., and has moved to Billings, where he will work for Yegen Brothers.

THE A. H. DAVENPORT COMPANY, Bangor, Maine, have recently been organized with a capital stock of $10,000 for the purpose of conducting a general plumbing business. The officers of the company are President, A. H. Davenport of Bar Harbor, and treasurer, Charles H. Babb of Bangor.

THE firm of Harris & Partridge, formerly of Jacksonville, Fla., have been organized under the title of the Aurora Acetylene Company, and have moved to Chattanooga, Tenn., where they will continue the manufacture of Acetylene Gas Generators.

JOHN E. MULVIHILL, Providence, R. I., who for the past ten years has been connected with the Thomas Phillips Company, is about to open a plumbing establishment at 3 North Main street.

THE plumbing and steam heating firm of Drury & Green, at Lowell, Mass., have been dissolved by the withdrawal of George Green. Mr. Green has opened a shop at 35 Market street.

THE MCKEOUGH-DANQUER PLUMBING COMPANY have been incorporated at Utica, N. Y., with a capital stock of $5000, by Thomas F. McKeough, Augustus W. Danquer and E. T. Danquer.

PARKHURST BROTHERS are a new firm, composed of A. H. and C. G. Parkhurst, who have entered the plumbing and tinsmithing business at Peterboro, N. H. They will do steam heating, hot water heating, furnace heating, tin roofing and all branches of sheet metal work.

ARMSTRONG BROTHERS of Somerville, Mass., have bought the plumbing and heating business of George A. Glover & Co. at Revere, Mass. In addition to plumbing and heating they will carry a full line of Stoves, Ranges and Furnaces.

WITTENBERG & BUGBEE are a new firm in the plumbing business at 402 Shawnee street, Leavenworth, Kan.

THE AMERICAN DISTRIBUTING COMPANY have been incorporated at Syracuse, N. Y., with a capital of $30,000, for the purpose of manufacturing Plumbing Supplies. W. Romeyn Smith is president and I. A. Weston secretary and treasurer. The company have secured a building at 204 Decker street for a finishing department, and a foundry is being erected at 265 Burnet avenue which is 40 x 70 feet in size. The traveling representatives of the company who will visit the plumbing trade are Harry P. Thompson, C. H. Cadwell and William H. Levere.

At a meeting on February 10 of all the Northwestern manufacturers of sash, doors and blinds at Tacoma, Wash., a permanent organization was formed and a revision of price-lists and trade discounts was made, resulting in the adoption of discounts, giving net prices slightly in advance of those agreed upon at the close of last year. It is understood that a further and more radical advance in prices is likely to be made at the next meeting of the manufacturers, to be held in April.

Under the caption of "Pilgrimage Made Easy," the *Electrical Review* prints the following item: "Cleveland and Chicago capitalists have applied for concessions for electric lines from Cairo, Egypt, to Mount Sinai, and then along the coast of the Red Sea through Syria and Arabia to Mecca, with a branch to Damascus."

Pattern for Elbow Springing from Pipe.

In *The Metal Worker* of October 26, 1901, there was illustrated a method of developing the pattern for an elbow springing from a round pipe. A correspondent signing himself "F. W. B.," and writing from Torrington, Conn., expresses a wish to see an illustration of the method of developing the pattern when the elbow is placed to one side of the center of a vertical pipe.

For the benefit of this correspondent as well as of other readers who may be interested in similar matters, we elucidate the problem, which presents an interesting study in projection. Referring to Fig. 1 of the accompanying diagrams, let A B represent the portion of the plan of the vertical pipe struck from the center C. Let D E 1 7 represent the position of the elbow in plan where it intersects the vertical pipe to one side of its center line. In its proper position draw the profile R, which represents the diameter of the elbow. Divide the profile R into equal spaces, as shown by the small figures 1 to 7. From these intersections parallel to 4 4′ draw lines indefinitely into the plan of the vertical pipe, as shown, intersecting the curve A B at points 1, 2, 3, 4, 5, 6, 7.

In its proper position, above the plan, draw the partial elevation of the vertical pipe, as shown by F G H. At right angles to E 7 in plan and from the point 7 on the curve A B erect a line, intersecting the base line G H in elevation at 7°. This point represents the center line of the elbow in elevation. Take the distance T 1 or T 7 in the profile R and place it on either side of 7° on G H in elevation, thus establishing the points *a* and *b;* then using the desired center, in this case I, with radii equal to I *b* and I *a* describe the quadrants, in which draw the desired pieced elbow, in this case four, as shown by *d e f g a b h i j c*. Draw the miter lines *e j*, *f i* and *g h*.

Now in its proper position draw the profile S, which divide into the same number of equal spaces as shown in the profile R, being careful to start point 1 to the right of the profile S, because if 4 4′ were the axis of the profile S and the point 7 would be turned up toward the reader, the points 1 and 7 would represent the sides of the elbow shown in plan by 1 and 7, while 4 and 4′ in profile S would represent the top and bottom of the elbow 4 and 4′, respectively, in plan. At right angles to E 7 in plan and from the intersections 1, 2, 3, 4, 5, 6, 7 on the curve A B project lines indefinitely into the elevation, as shown from 1″ to 7″. Now at right angles to *d c* in elevation and from points in the profile S draw lines intersecting the miter line *e j* of the elbow, as shown. Parallel to *e f* and from the intersections obtained on the miter line *e i* from points 5, 4, 3, 2, 1 2′, and 3′ in the profile S draw lines intersecting vertical lines having similar numbers, as 5″, 4″, 3″, 2″ and 1″, thus obtaining the intersections 5x, 4x, 3x, 2x, 1x, 2v and 3v, respectively, as shown, and extending the lines drawn parallel to *e f* until they intersect the miter line *f i*. Parallel to *f g* and from the intersections obtained on the

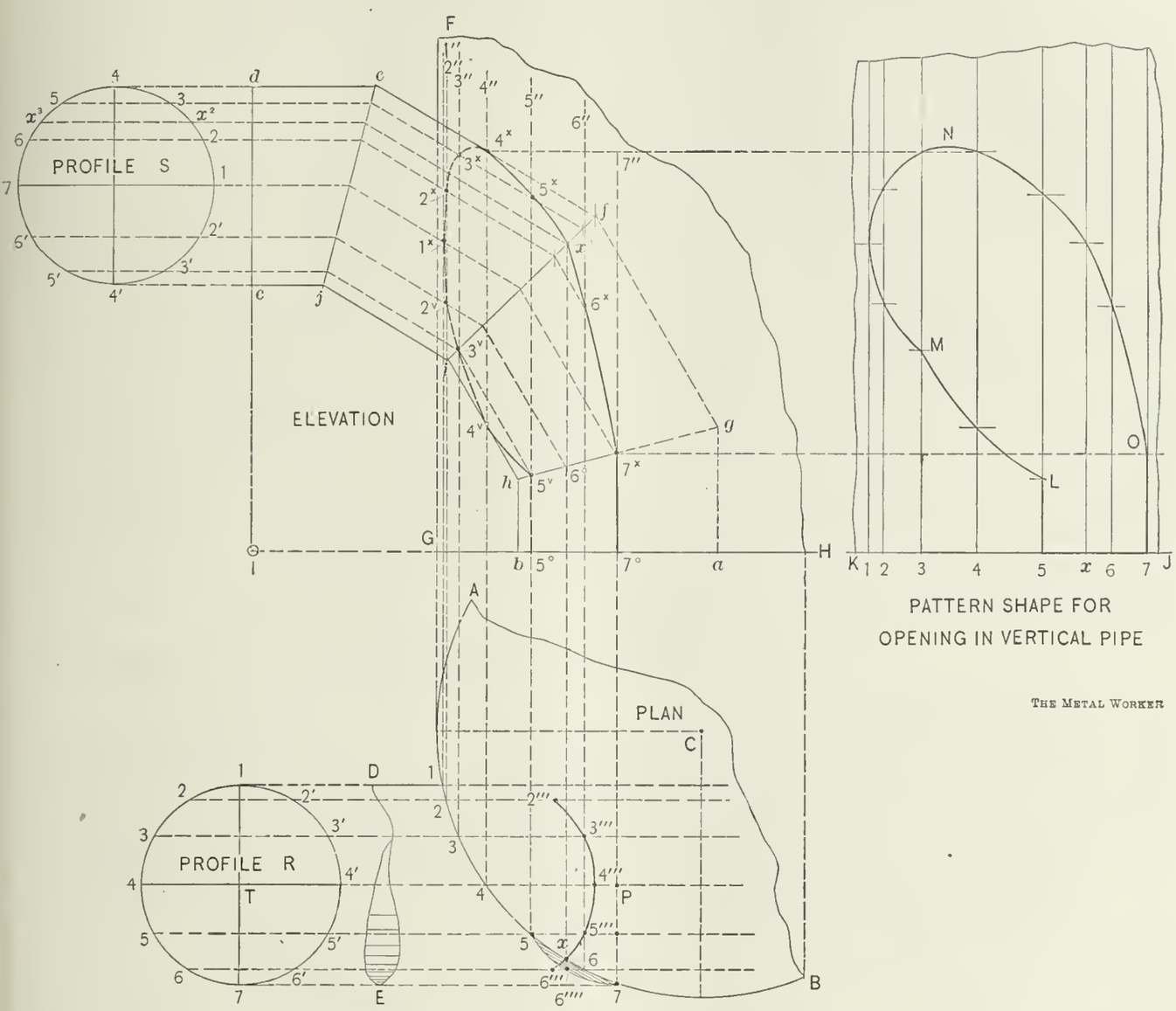


Fig. 1.—Plan, Elevation, Profiles and Shape of Opening in Vertical Pipe.

PATTERN FOR ELBOW SPRINGING FROM PIPE.

miter line *f i* from points 6, 7, 6′, 5′ and 4′ in the profile S draw lines intersecting vertical lines having similar numbers, as 6″, 7″, 6″, 5″ and 4″, thus obtaining the intersections 6x, 7x, 6o, 5v and 4v, respectively, as shown.

It will be noticed that the lines drawn from the points 5′, 6′, 7 in the profile S intersect the miter line *g h* in elevation at 5v 6o 7x, respectively. From these points drop lines until they intersect similar horizontal lines in plan drawn from points 5′, 6′, 7 in profile R, thus obtaining the points 5, 6‴″, 7, which will represent the amount the proceed as follows: From the points of intersections on the miter line *f i* corresponding to points 2, 3, 4, 5 and 6 drop vertical lines, not here shown, intersecting horizontal lines of similar numbers in plan, as shown by the intersections 2‴ to 6‴, respectively. Through these intersections trace the partial elliptical figure, as shown, intersecting the plan of the vertical pipe at X, being the desired point. From X draw a vertical line upward intersecting the miter line *f i* in elevation at X¹. Now through the intersections in elevation draw the miter

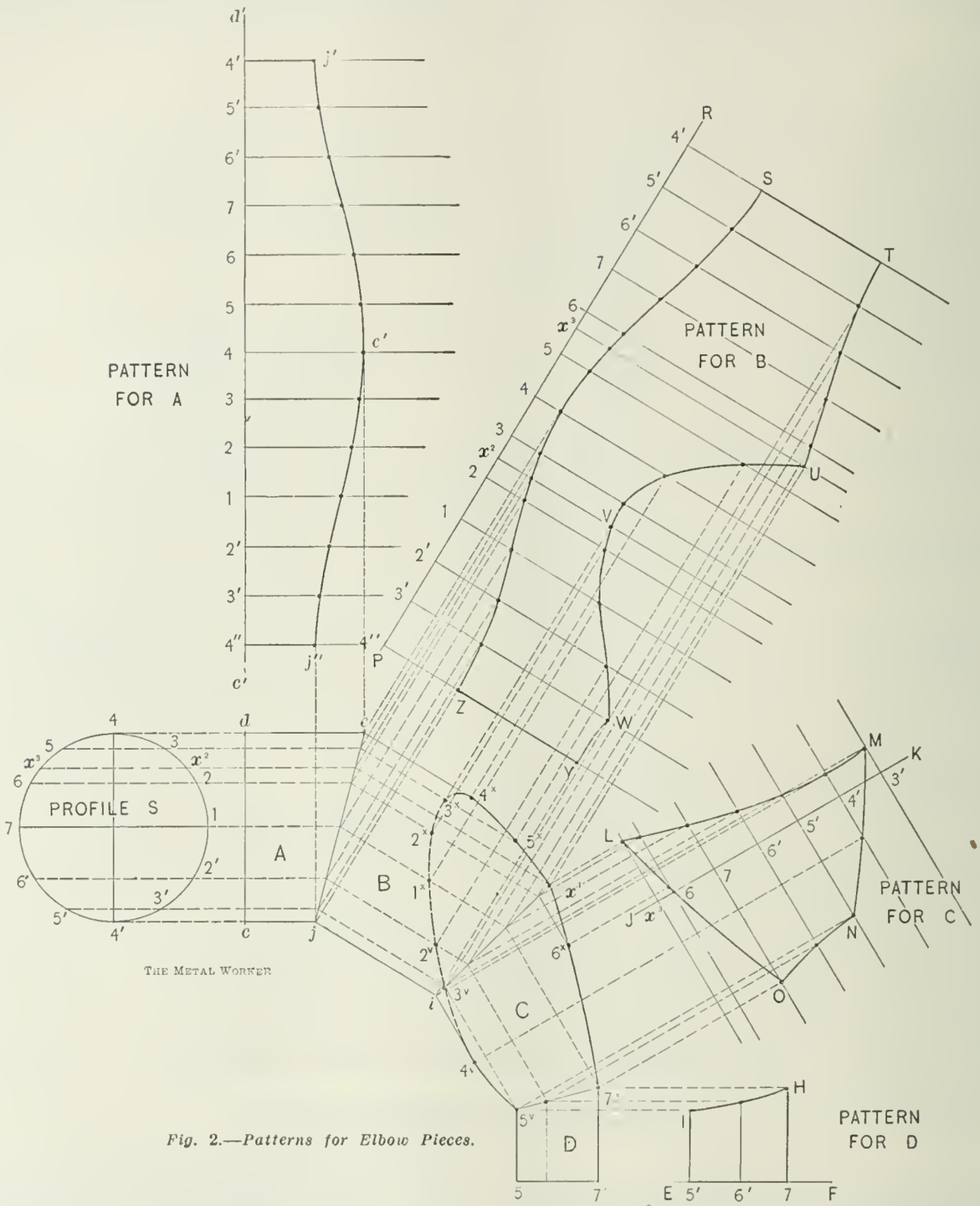


Fig. 2.—Patterns for Elbow Pieces.

PATTERN FOR ELBOW SPRINGING FROM PIPE.

lower section of the elbow will project beyond the vertical pipe, as shown by the shaded portion in plan, and in elevation by 5o, 5v, 7x, 7o.

The center point P in plan, from which the arc 5, 6‴″, 7 is struck, is obtained by the intersection of the line dropped from 7o in elevation to 7 in plan with the line drawn from the center T of the profile R, thus establishing the point P.

Before drawing the miter line through the points of intersections on the vertical lines in elevation it will be necessary to know where this miter line will intersect the miter line of the elbow *f i*. Therefore a partial horizontal section will be required on the line *f i*, for which line, 5o to 5v to 3v to 4x to X¹ to 7x to 7o, which represents the line of joint between the elbow and vertical pipe.

For the pattern for the opening to be cut into the vertical pipe proceed as follows: In line with G H of the elevation draw the line H J, upon which place the stretchout of 1, 2, 3, 4, 5 X, 6 and 7 in plan, as shown by similar numbers on H J. At right angles to H J and from these points carry lines upward, which intersect with lines, not here shown, drawn from intersections having similar numbers in the miter line in elevation at right angles to F G. Trace a line through points thus obtained, as shown by 5 L M N O 7, which will be the pattern for the opening in the vertical pipe. From the point X¹ on

the miter line *f i* in elevation and parallel to *f e* draw a line intersecting the miter line *e j*, as shown. From this intersection parallel to *e d* draw a line intersecting the profile S at X^2 and X^3. These points will be used in developing the patterns for the elbow pieces.

For the patterns for the four pieces in the elbow and to avoid a confusion of lines take a tracing of the profile S with the various intersections on same, also of the elbow with the miter lines and various points of intersections, and place it, as shown, by similar letters and figures in Fig. 2, in which the four pieces in the elbow have been lettered A, B, C and D. For the pattern for the piece D draw the line E F at right angles to 7x 7o, upon which place the stretchout of 5′, 6′, 7 in the profile S, as shown by 5′, 6′, 7 on E F. At right angles to E F erect lines, as shown, which intersect with lines drawn from intersections of similar numbers on the miter line 5v 7x at right angles to 7x 7o. A line traced through points thus obtained, as shown by H I 5′ 7, will be the pattern for D, corresponding to 5, 6″″, 7 in plan, Fig. 1.

For the pattern for C in Fig. 2 draw at right angles to 3v 5v the line J K, upon which place the stretchout of X^8, 6, 7, 6′, 5′, 4′ and 3′ in the profile S, as shown by similar figures on J K, at right angles to which, through the small figures, draw lines indefinitely, which intersect with lines drawn from intersections of similar numbers on the miter lines shown, at right angles to 3v 5v. Trace a line through points thus obtained, as shown by L M N O, which will be the pattern for piece C. For the pattern for B draw the line P R at right angles to *j i*, upon which place the full stretchout of the circle or profile S, being careful to place the extra divisions X^3 and X^2 in profile S in their proper divisions on P R, all as shown. At right angles to P R and through the small figures draw lines indefinitely, as shown, which intersect with lines drawn from intersections of similar numbers on the miter lines shown, at right angles to *j i*. Trace a line through points thus obtained; then will S T U V W Y Z be the pattern for B. In precisely the same manner obtain the pattern for A, which is shown by *d′ j′ e′ j‴ e′*. Allow laps for riveting and seaming.

THE BERGER AND CARNAHAN PLANTS AT CANTON, OHIO.

In the *Roller Monthly* of Canton, Ohio, an interesting account is presented of the big works of the Berger Mfg. Company, the Stark Rolling Mill Company, the Carnahan Tin Plate & Sheet Company and the Carnahan Stamping & Enameling Company, the interests of which four concerns are closely allied and which, combined, form one of the greatest manufacturing enterprises of its kind in Ohio.

The growth of the Berger Mfg. Company has been remarkable. The business was started in 1886 with half a dozen men. It was situated in the basement and afterward in the second story of a blacksmith shop. The business extending, the factory was soon moved to more commodious quarters, where additional men were employed. Another move was made necessary within a short time, and then it became imperative to erect large buildings for the accommodation of the firm's growing business. A site was secured at what is known as Crystal Park, and the nucleus of the present large establishment was built there. Many additions and improvements were subsequently made, as the output of the concern became heavier and more diversified, and it was only a few years before the Berger works became one of the leading manufacturing industries of the city of Canton. The establishment of the plant in the northeast part of the city of Canton gave a stimulus to real estate in that section, streets being laid out and numerous dwellings to shelter the families of the workmen being erected. Gradually the locality grew up to be one of the pleasantest portions of the city.

The output of the Berger Mfg. Company is principally sheet iron and steel products, such as eave trough, conductor pipe, and roofing and siding of all kinds, cornices, architectural iron work, skylights, metal ceilings, and, in fact, all varieties of structural sheet metal goods. Fire proofing, lanterns, oil cans and spray pumps were subsequently added to the products of the concern and now form a large part of their manufacturing business.

The past year was by far the most prosperous in the history of the company, the output being nearly double that of any previous year. Under the management of Edward A. Langenbach, the secretary and general manager of the company, the operation of the factory has been systematized, each department working under a separate superintendent, who reports to the general manager. In one building, 60 x 600 feet, cornice, eave trough and conductor pipe are produced. In another department, 48 x 250 feet, the product is roofing and siding, including imitation brick and stone. A third department is devoted to the manufacture of all styles of tubular lanterns, including street lamps and railroad lanterns, also oil cans, pumps, &c. The metal ceiling department, housed in two buildings, 40 x 120 feet and 30 x 60 feet respectively, is one of the most important. The company's Classik metal ceilings are now well known throughout the country. Other departments of the concern include a galvanizing shop, 48 x 300 feet; a black sheet warehouse, 50 x 200 feet; warerooms, 40 x 326 feet, and offices, modeling, refining, fire proofing, painting and shipping departments, together with boiler house, electric plant, blacksmiths' shop, gas producers, &c., all housed in separate buildings.

Eighteen traveling salesmen are on the road selling the products of the company, and branch houses have been established in New York, Boston, Philadelphia, Chicago and St. Louis. Agencies have also been opened in many other leading cities of the country.

The original Berger Mfg. Company took their name from John and William Berger, who were the founders of the business. The present officers of the company are Joseph Biechele, president; Charles Lang, vice-president; W. W. Irwin, superintendent, and Edward A. Langenbach, secretary and manager. Mr. Irwin was formerly with the Canton Rolling Mill Company and later with the Dennison Rolling Mill Company of Dennison, Ohio. After the absorption of the latter company by the American Sheet Steel Company he returned to Canton and purchased the John A. Berger interests in the Berger Mfg. Company.

THE STARK ROLLING MILL COMPANY.

The Berger works consumed so large an amount of sheet metal and the expense of transporting it to Canton was found so heavy that it was decided a short time ago to establish a rolling mill alongside of the present plant. The Stark Rolling Mill Company were formed for this purpose, with J. E. Carnahan as president; Joseph Biechele, vice-president; Charles Irwin, secretary, and Edward A. Langenbach, manager.

Much of the success of the concern has been due to the efforts of Mr. Langenbach, who has been manager of the Berger Company ever since their organization. To his influence is due the bringing to Canton of the Carnahan Industries, which have become allied with the Berger Interests. J. E. Carnahan, from whom the Carnahan Tin Plate & Sheet Company and the Carnahan Stamping & Enameling Company took their names, is one of the most successful men in the iron and steel industry. He was the founder of the Mesta works in Pittsburgh and also of the Canton Roll & Machine Company.

THE CARNAHAN TIN PLATE & SHEET COMPANY,

organized last year to build a plant for the manufacture of tin plate and black plate, have an annual output of some 12,000 tons of finished material and employ 600 men. The machine building is 125 x 600 feet, and is one of the finest and most complete tin mills in the country. George Evans, the superintendent of the plant, is regarded as one of the most competent tin mill men in the United States. He was formerly the superintendent of the Beaver Tin Plate Company of Lisbon, Ohio. Mr. Evans is assisted by Edwin Griffith, another expert tin mill man, formerly with the Star Mills of Pittsburgh. The company are officered as follows: President, J. E. Carnahan; vice-president and general manager, Edward A. Langenbach; secretary and treasurer, Wil-

llam M. Blecker. Mr. Blecker is from Leechburg, Pa., and was for a number of years connected with large iron and steel plants in various parts of the State of Pennsylvania. He was one of the founders of the Canton Roll & Machine Company.

Plans are already under way for and work will soon be begun upon the erection of a steel mill to produce 1200 tons a week, in connection with the Carnahan plant. Other extensions to the plant are also in contemplation which will very largely increase the capacity. The output is used almost exclusively by the Berger works and

THE CARNAHAN STAMPING AND ENAMELING COMPANY.

The last named company have been organized for the manufacture of stamped and pieced tinware, galvanized ware, enameled ware and fruit cans. The plant is now under construction and is expected to be in full operation by about March 1. The main building is a four-story brick structure, 50 x 200 feet. The stamping and enameling building is 90 x 120 feet, the galvanizing building 30 x 90 feet and the boiler house 32 x 42 feet.

The company are capitalized at $300,000 and the officers are: President, J. E. Carnahan; first vice-president, William M. Blecker; second vice-president, H. C. Milligan; general manager, Edward A. Langenbach; secretary and treasurer, Millard F. Taylor. Mr. Taylor is from Leechburg and was formerly the secretary of the Canton Rolling Mill Company until that concern were absorbed by the American Sheet Steel Company in 1898. H. C. Milligan, the second vice-president, has charge of the enameling department. He is an expert in this line, having been for many years with the Lalance & Grosjean Mfg. Company of New York City, the largest enameling concern in the world. In 1884 he patented his process of enameling and some years later built the Crescent Enameling Works, at Cleveland, Ohio, which plant he conducted successfully until he recently consolidated with the Carnahan interests and removed to Canton. The process under which the concern will operate is known as the Milligan process.

Taken all together, the four companies named employ not less than 2000 men, which means nearly 10,000 people in the city of Canton practically dependent upon the allied enterprises. It will thus be seen how important these enterprises are to the prosperity and welfare of the city of Canton.

Imports of Tin Plates in 1901.

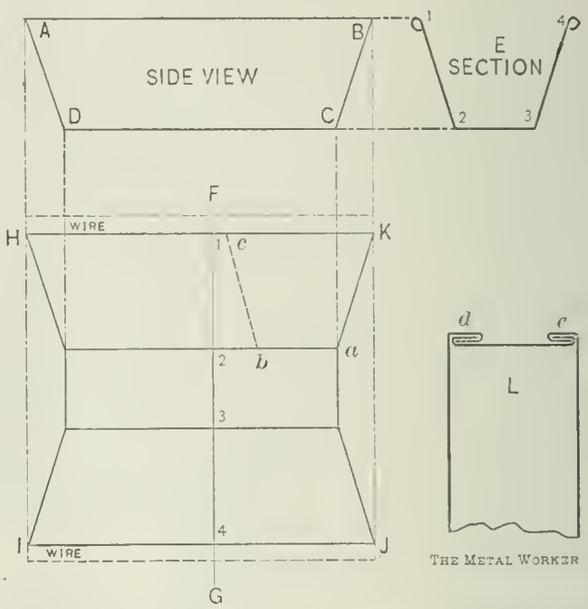
The annual figures of the Treasury Bureau of Statistics for 1901, just published, show a total importation of tin and terne plates and taggers tin for the year amounting to 86,682 tons, as compared with 67,632 tons in the calendar year 1900 and 65,935 in 1899. This shows a marked growth in the imports of tin plates into the United States last year as compared with preceding years, caused obviously by the closing down of the tin plate mills for over three months last summer owing to the strike and the consequent restriction in the production of domestic tin plates. The importation of sheet, plate and taggers iron or steel in 1901 is placed at 6301 tons, as compared with 5761 tons in 1900 and 7884 tons in 1899. The total imports of pig tin in 1901 are given as 37,280 tons, as against 34,995 in 1900 and 35,624 tons in 1899.

THE NOVELTY HEATING COMPANY, Jamestown, N. Y., have the contract for the copper work for the new fire proof storehouse of the American Aristotype Company. They are also putting up a handsome steel ceiling in the shoe store of Bealor & Sons, and in the store of the Greek-American Fruit Company. The company are making the Steel Cornices and Skylights, and are putting on a tin roof and a steel ceiling in the Merz & Thomas Building. They also have the contract for the Cornices and Skylights in the buildings of H. A. Shafer, the Home Telephone Company and Andrew Runquist, and are putting a tin roof on the City Armory in place of the slate roof that has been on it for years.

PATTERN FOR BREAD PAN.

Without Allowance for Laps.

A bread pan can be made of tin plate or sheet iron, and can be bent over the hatchet stake if no brake is at hand. The top edge is wired, and the ends double seamed. Let A B C D, in the illustration, be the side view of such a bread pan, having equal flare on four sides, and E the section, showing the amount of material required for the body of the pan, as indicated by the small figures 1, 2, 3 and 4. For the pattern draw any line, as F G, at right angles to D C, upon which place the stretchout of the section E, as shown by the small figures 1 to 4 on F G. Through these small figures and at right angles to F G draw lines, as shown, which intersect with lines drawn from similar points in side view, as shown. Trace a line through intersections thus obtained, as shown by H I J K, which will be the pattern for the body of the pan. As the flare of the pan is equal



Pattern for Bread Pan.

throughout, as before mentioned, then for the pattern for the end pieces simply take the distance 3 to 2 in section and place it, as shown, from *a* to *b* in pattern, and the distance 4 to 1 in section and place it from K to *c* in pattern. Connect these points, when K *a b c* will be the pattern for ends. Allowance for wire is shown by the dotted lines. Diagram L shows the method of double seaming the ends or heads to the body, as at *d* and *e*, showing that single edges must be allowed to the ends and double edges to the body of the pan. Wire rings can be riveted to the ends if desired.

FLASHINGS.

THE MONUMENTAL MFG. COMPANY of Baltimore, Md., have been incorporated by Jacob W. Hook, Walter Snyder, C. Howard Hook and others, with a capital of $50,000, to manufacture Tin Specialties.

THE NEW ENGLAND STEEL ROOFING COMPANY, 274 Main street, Worcester, Mass., have been very busy recently, working nights at times to keep up with their orders. They have contracts for a large amount of Sheet Metal Work in Maine, including the High School at Lewiston, City Hall at Waterville and the Odd Fellows' Block, and a new hotel at Rumford Falls.

BESEMAN & BOSTWICK of Hartford, Conn., have the contract for the metal work on the new Opera House, at Winsted, Conn.

THE offices of the Parkersburg Iron & Steel Company, which are at present located in the Times Building, Pittsburgh, Pa., will, after April 1, be moved to Parkersburg, W. Va., where the company's mills are located.

WE are indebted to C. S. Trench & Co., New York City, for a copy of the useful Pig Tin chart that they have prepared and are distributing among the trade. The chart shows the movements of prices of Pig Tin in each month of the four years, 1898 to 1901. The highest,

lowest and average prices made by the metal are also indicated for each month. The exhibit shows that Tin made its lowest record of recent years—13¾ cents—in January, 1898, and its highest—35 cents—in July, 1900.

The E. Van Noorden Company, Boston, Mass., have recently placed 28,000 square feet of their Sheet Metal Skylight in the plant of the Great Northern Paper Company, at Millinockett, Maine. They have also just furnished Skylights of their coustruction for J. E. Henry & Sons' new pulp mill, at Lincoln, N. H.; for the Crane Company, at Dalton, Mass., and the Oxford Paper Company, at Rumford Falls, Maine, and are now erecting a large Skylight 16 feet span by 177 2-3 feet long for the Eastern Mfg. Company's paper plant at South Brewer. In addition, the company are now erecting 260 Single Pitch Skylights, each 7 feet 7 inches by 8 feet, aud 40 7 feet 7 inches by 9 feet 11 inches, each for the Soule Mills, at New Bedford, Mass., as well as 496 Single Pitch Skylights 8 x 8 feet, and 103 Revolving Ventilator Cowls 18 inches in diameter, for the Atlas Tack Company, at Fair Haven, Mass.

The plant of the American Tin Plate Company, at Atlanta, Ind., is beiug dismantled. It is understood that the buildings and ground will be purchased by the Uuion Traction Company of Indiana, and used for the erection of a plant for the manufacture of Electric Railway Machinery.

The tinning department of the Carnahan Tin Plate & Sheet Company, Canton, Ohio, was started last week. Three of the six eold rolls were also placed in operation and two additional hot mills will shortly be added.

The machinery of the plant of the American Can Company, at Youngstown, Ohio, is being removed, aud will be iustalled in some of the company's factories in Chicago. The reason for the dismautling of the Youngstown plant is that it was located too far from the center of the can market.

Torbett & Beckham, Monadnock Building, Chicago, have purchased from the American Sheet Steel Company the land and buildiugs at Hammond, Ind., formerly used by the Corning Steel Company, in the mauufacture of Sheets, and will adapt them to other manufacturing purposes. The Corning plant was dismantled on coming into the hands of the American Tin Plate Company about two years ago.

Revived rumors of a eousolidation of the independent Tin Can manufacturing iuterests of the country have been current during the past week. It is claimed that substantial interests have the matter in hand with considerable prospeet of a favorable outcome. The fact that the American Can Company are closely allied with the United States Steel Corporation would seem to offer a serious obstacle to any organization of independent manufacturers in this line, as they would be obliged to purchase their supplies of Tin Plate from the steel corporation, who have practically the monopoly of this product in the United States. For this reason it would seem that an independent concern working in antagonism to the American Can Company might experience more difficulty in securing supplies of material than would be met with by individnal plants, whose operatious would not be important enough to come into violent competition with the so-called Tin Can Trust.

The Treasury Bureau of Statistics has issued the statistics of drawback allowed on imported material used in the manufacture of goods subsequently exported for the fiscal year ended June 30, 1901. This statement shows that the quantity of Tin Plate, on which a drawback of 99 per cent. on the original duty paid was allowed in the period named, was 127,261,883 pounds, as compared with 125,269,126 pounds in the preceding fiscal year, and 122,906,682 in the fiscal year 1899.

The American Rolling Mill Company of Chicago, who are operating a Sheet plant at Middletown, Ohio, have purchased the rolling mill at Sandwich, Ill., which has been idle for some time. This plaut has a 9-ineh finishing train of rolls, and an 18-ineh, three-high muck mill. The company, it is said, will install a 16-ineh train of finishing rolls, and will also build eight double busheling and puddling furnaces.

The Juniata Tin Plate Company, recently incorporated with a capital stock of $250,000, will build a Tin Plate plaut at Greencastle, Pa., of which F. M. Strong, for a number of years manager of the plant of the old American Tin Plate Company at Ellwood, will be the manager. Others interested are Samuel Lewis, William H. Richards, J. H. Seibeiling and H. M. Strong.

A discovery of Tin deposits is reported about 12 miles from Cape York in the Cape Nome district of Alaska. The Tin bearing territory is said to cover some 2000 acres to an average depth of 6 feet. A small amount of the ore which was recently assayed is claimed to have yielded nearly 65 per cent. metallic tin.

Neal Brothers of Pittsburgh, who are operating a mill on the South Side in the mauufacture of Black Sheets, are preparing to install a galvanizing plant to make Galvanized Sheets for the open market.

The new plant of the Carnahan Tin Plate & Sheet Company, at Canton, Ohio, is in operation to full capacity, turning out all grades of Tin and Terne Plate, also Black Plate. This concern have decided to add another mill to their plant, which will make it a seven-mill plant, and advise us they have all the orders they can take care of for the next four months to coue.

A movement is being made in Baltimore, Md., to establish in that city a Sheet Metal Workers' Union. This is the first time the formation of such a union has ever been attempted in that city. The proposition of the new union is that nine hours shall constitute a day, and the minimum wage shall be $2.50, and that only union men are to be employed, although nonunion men may be taken on upon the condition that they join the union within a week after being so employed. It is further demanded that only one appreutiee be allowed for every four journeymen, and the apprentice must serve four years, or longer if deemed necessary in the opinion of his employer to complete his trade. The employers represented at the meeting were John G. Hetzell & Son, Vaile & Young, M. J. Frederick & Bro., the Northwestern Cornice Works, A. Kohlhepp, Schultz & Ellis and William T. McDermott.

The Leading Exporter.

The Uuited States maintained its position as the leading exporting nation in the caleudar year 1901. The figures of the Treasury Bureau of Statistics, just published, show the exports of each of the principal countries of the world at the latest available date, and clearly indicate that the exports of the United States were during the year larger than those of any other nation. While the total for the full caleudar year is only shown in the case of a few of the more important nations, the monthly average for the portion of the year for which figures are available is showu in the case of practically every country. This statement shows that the average mouthly exportations in the year 1901 were: United States, $119,840,333; United Kiugdom, $113,753,987; Germany, $90,242,000; France, $66,929,329; Netherlands, $56,790,923; Austria-Hungary, $32,012,746, and Belgium, $28,678,729. For the full calendar year figures of the Uuited States and United Kingdom are available. They show: United States, $1,438,083,000; United Kingdom, $1,365,047,843. The exports of the United States thus exceed by nearly $75,000,000 those of the United Kingdom.

Ou the import side the United States stands fourth in the list of nations, the imports for the calendar year averaging $73,368,421 per mouth, against $211,789,669 for the United Kingdom, $111,646,000 for Germauy, $75,483,423 for France, $65,922,642 for Netherlands, $34,942,018 for Belgium and $28,600,569 for Austria-Huugary.

The House Committee on Coinage, Weights and Measures last week heard representatives of leading manufacturers and business men on the advisability of adopting the metric system of weights and measures. The sentiment developed was nearly unanimously favorable to the adoption of the metric system, and it is regarded as almost certain that a favorable report on the measure now pending will be made to the House by the committee, with an exeellent prospect of the bill passiug at the present session of Congress.

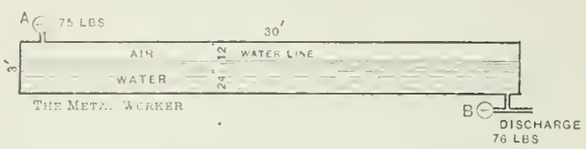
THE LETTER BOX.

Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

A QUESTION OF WATER PRESSURE.

From W. & Co., Chariton, Iowa.—To settle a dispute, we desire information from *The Metal Worker*, or an experienced reader, on the following proposition: Water is forced in at the bottom of a horizontal boiler until the gauge indicates a pressure of 75 pounds. Should this boiler be raised to a vertical position, would the



A Question of Water Pressure.—Fig. 1.—Boiler in Horizontal Position.

pressure remain the same, or would it be greater, or discharge the water from a nozzle with any greater force than if it had remained in a horizontal position?

Answer.—This proposition has been referred to an expert, who has sent us the following:

In reply to the question relative to the difference in pressure in horizontal and vertical boilers, I would say that in the case cited, where the outlet and gauge are at the bottom of the boiler, the gauge would indicate higher pressure when the boiler is in a vertical position, the increased pressure being due to the head of water. To make this clear, let it be assumed that the boiler is to be 36 inches in diameter and 30 feet long and filled one-third with air and two-thirds with water. It makes no difference in what position the boiler is placed, the relative volume of air and water remains the same, but the hight of the water line from the base of the boiler is dependent on the position of the boiler. The accompanying sketches will make this clear, Fig. 1 indicating



Fig. 2.—Boiler in Vertical Position.

the boiler in a horizontal position and Fig. 2 the same boiler in a vertical position. The pressure gauge is generally placed at the top of the boiler, as at A in both sketches. In this position it indicates the pressure acting on the surface of the water. As stated, the relative volume of air and water does not change; consequently, when the boiler is horizontal and two-thirds full, the boiler being 36 inches in diameter, there is a head of water of 2 feet resting on the bottom of the same. This head of water produces practically 1 pound pressure, which, added to 75 pounds, makes 76 pounds pressure at the gauge B, or at the discharge, instead of 75, as indicated by the gauge A at the top of the boiler.

Now, if the same boiler and its contents are placed in a vertical position, it would be found that the water fills two-thirds of the boiler. The hight of the boiler being 30 feet, there is a head of water of 20 feet, that will produce a pressure of about 10 pounds at the discharge or bottom of the boiler. This makes the gauge A read 75 pounds for the pressure acting on the surface of the water, plus the 10 pounds pressure due to the head of 20 feet of water, making a total of 85 pounds pressure at the gauge B when the boiler is in a vertical position, against 76 pounds pressure when the boiler is placed horizontally. The figures in this calculation are not exact, but are sufficiently correct for use in illustrating the point in question. In reply to the second part of the question, I would say that the higher the pressure the greater the discharge.

WHY DID THE VALVES FREEZE?

From N. K., New York.—The statement "F. L. W." makes in *The Metal Worker* of February 8 is one that I can hardly understand in reference to radiator valves, if all the conditions are exactly as he states. If he found the stuffing box of the valve flooded and frozen I could see how, under some conditions, this might happen; but they would have to be unusual, for, in a long experience, I have never known such a thing to happen. The bonnet, however, is so constructed in valves with which I am familiar that it would seem impossible unless the radiator and piping were flooded when the freezing occurred. He says that the valves on the radiators are left open, so that the water can run back to the boilers. If there are positive air valves on the radiators they might hold 2 or 3 inches of water in the bottom of the radiator and flood the valve, and cause the trouble mentioned without the water freezing in the radiator to such an extent as to cause its destruction. I would suggest that he make an examination of his air valves, and if they are not in good condition replace them with a good automatic air valve. The radiator valves should also be carefully examined, and if their construction is such as to be conducive to the trouble reported, they should be replaced with a radiator valve of better construction.

PROTECT TANK PIPE FROM FREEZING.

From J. H. Edwards, 59 Park place, New York.—Replying to the inquiry of "S. and S." in *The Metal Worker* of February 8 regarding the protection of a tank supply pipe from freezing, there are four principles which are very frequently neglected or omitted, and lack of knowledge, which is the cause of all the trouble of the tank pipe freezing. The neglect consists in not having the pipe absolutely water tight before applying the covering; in not using proper nonconducting material, in a poor or careless application of it and in not changing the temperature of the water in the tank at least once a day. The best possible form of nonconducting material applied to exposed water pipes creates no warmth, acting simply as a nonconductor to frost from the outside surface of the pipes. During freezing weather the temperature of the water in the tank should be changed at least once every 24 hours by pumping a few hundred gallons of water into it, which, if taken from a spring or well, will be at a temperature of about 50 or 52 degrees. If this is not done during freezing weather the water in the tank will reach freezing point, and in consequence the water in the pipe will freeze from the inside, and all the protection that might be applied will not prevent it. If "S. and S." will see that their pipe is absolutely water tight, also that where it enters the tank, there is no possibility of leakage occurring, and will apply a proper nonconducting material, they will find this will absolutely protect their pipes from freezing under any temperature. I would suggest the use of sectional cork pipe covering, 2¼ inches thick, carefully applied, so that all joints are absolutely tight, and then wrapped with canvas, painted with two coats of water proof paint, carrying this covering flush

against the tank bottom and extending it to at least 4 feet below the ground. Then, during freezing weather, change the temperature of the water every day by pumping more water into the tank.

ZINC FOR MILK VESSELS.

From J. C. B., New York.—I find cause for objection to the answer to the inquiry of "F. W. K." in *The Metal Worker*, February 8, as to the advisability and propriety of using zinc as a material for a vessel to be employed as a container for milk. What you tell your correspondent is, I fear, misleading, and may do much harm. It is a safe generalization that zinc should never be brought into contact with any fluid to be subsequently taken into the human system. All waters, almost without reference to their chemical composition, dissolve zinc and all the salts of zinc are poisonous. Thorough cleansing of the surface of zinc, of course, reduces the danger of poisoning, but it is impossible to insure the maintenance of cleanliness, and if it were the trouble would be at best mitigated, not corrected. It involves a violent stretch of the imagination to believe that the bottom of a milk tank, 11 x 3 x 1½ feet, would be kept as clean as you prescribe. But if it could be, the danger would still be sufficiently serious to discourage the use of that metal in such a place. Your reference to the general use of zinc in water coolers should not, I think, be considered as warranting such use. It accounts for a great deal of stomach and bowel trouble among those who drink water from such coolers. This fact is well known among chemists and physicians, and has been stated in every text book relating to the chemistry of metals for half a century. Black iron treated with asphalt varnish would make a much better milk tank than one with a bottom of sheet zinc.

Note.—Our answer treated a case where the zinc bottom had already been put in the tank as the most available material in an emergency, and did not advise the use of zinc. Our views on this question correspond, in the main, with those of this correspondent.

NOISY BOILERS

From F. B. H., Lisbon, Ohio.—I would like to inquire what causes a kitchen range boiler to make a rattling, cracking noise when cold water is drawn at the sink.

Answer.—This might be caused from a loose part in some of the bibs connected with the plumbing system: or it might be caused by the water being at a high temperature, and when the pressure in the boiler is reduced by the relief afforded from opening a faucet, the water then changing to steam quickly and the quick condensation causing a vacuum that would make a jar and a rattling as water rushed in to fill the vacuum. If the pipes run up to the ceiling, and are then carried over to the sink and dropped down, air might accumulate at the high point in sufficient quantity to impede the flow, causing a rattling and jarring of the piping, which might carry the sound to the boiler, where it is given off and attracts attention.

A QUESTION OF BOILER POWER.

From T. N. R., New York.—Will you kindly inform me how many feet of 1-inch pipe, attached to a 10 horse-power boiler, can be used as a radiator in an evaporating chamber, and a pressure of 80 pounds per inch be maintained ?

Answer.—About 2.9 lineal feet of 1-inch pipe are equivalent to a square foot of heating surface. One boiler horse-power is equivalent to about 33,000 heat units per hour. Steam at 80 pounds gauge pressure has a temperature of approximately 323 degrees. A pipe coil, with natural circulation of air, will give off about 2 heat units per square foot per hour per degree difference in temperature between the steam and the surrounding air. With forced circulation produced by a fan the heat given off would be five or six times the amount just stated. Our correspondent does not state the temperature to be maintained in the evaporating chamber. Assuming this, however, to be 140 degrees, the difference in temperature between steam and air would be 323° — 140° = 183°, and a square foot of heating surface would give off 2 × 183° = 366 heat units per hour. A 10 horse-power boiler would produce 10 × 33,000 = 330,000 heat units per hour, which, divided by 366, gives approximately 900 square feet of heating surface, equivalent to 2.9 × 900 = 2610 lineal feet of 1-inch pipe. If the evaporating chamber is to be kept at a lower temperature than that assumed the boiler will be capable of supplying less surface; if at a higher temperature more surface, based on the difference in temperature as above stated.

IS IT POOR DRAFT ?

From J. S. R., Philadelphia.—I have noticed the inquiry of "B. R." in *The Metal Worker* of February 8, and think you have solved the problem in the query with which you have have headed his letter, "Is it Poor Draft?" To my mind there is no question but that the trouble is entirely due to the poor draft. The description shows just exactly what might naturally be expected under the conditions presented. Here is a furnace in which all the coals have reached the state of incandescence, and the fire needs replenishing with fuel. When fresh fuel is added the intense heat expands the coal and liberates the gas in large quantities. The draft door is open, causing the air pressure under the grate to drive the gases up. The gases being unable to escape, owing to the poor draft, expand under the influence of the fire, and when they come in contact with a small amount of air through any crevice in the construction an explosion occurs from the expansion or ignition of these gases, which blows the door open. If, as "B. R." describes, there was a good draft, the gases might be carried away fast enough to cause an absolute waste of fuel, and surely fast enough to avoid the explosion. If he will clean the chimney, see that it is of proper shape and sufficient size for the surface of the grate and quantity of fuel under combustion, or enlarge his smoke pipe so that the draft will not be throttled, he will be working along the right lines to learn the cause and remove the trouble reported. I shall be glad to hear from other practical furnacemen as to whether my views on this subject are correct. I hope also that "B. R." will take up the suggestion for improving *The Metal Worker* made by "H. & W.," in the paper of January 25, and will report what experiments he tries and what success has attended these experiments.

Openings for American Trade in Siam.

There is not in the whole of Siam at present, says United States Consul-General Hamilton King of Bangkok, in a recent report to the State Department, one American house competent to consider a business proposition or a Government contract, to push American trade, or to represent American interests. Other nationalities are well represented and are constantly seeking business. It cannot be expected that business will seek Americans in Siam more than in any other country. The Consul-General is of the opinion, after a residence of three years and a half in Bangkok, that an American business house should be established in that city, and that there is an excellent outlook for such an enterprise. To build up an American trade in Siam the house, he says, must be run on American lines and managed by American business men, who are on the ground, and who have acquainted themselves with the local conditions. Among the prime needs of the city he mentions the necessity for a sewerage system, the absence of which at the present time accounts largely for the epidemics of cholera and other scourges which periodically visit the city and carry off thousands of its inhabitants. The country of Siam is of great natural wealth, which only needs the requisite enterprise and capital to develop it. The Consul-General believes that a great field exists there for American enterprise, not only in the line of trade, but also in engineering and the undertaking of mining, agricultural operations and public works, in which undertaking Americans would, he believes, have the ready support of the Siamese Government. Among the goods which he mentions as being sure to find quick sale are clocks, lamps, bicycles and sewing machines.

TRADE REPORT.

MARKET SUMMARY.

Pig Tin is quiet and ½c. higher in price.

Copper is still unsettled and a shade lower, with light demand.

Pig Lead is very firm and more active.

Spelter remains weak and dull.

Antimony is unchanged.

Nickel is in good demand at former prices.

Aluminum is active at unchanged prices.

Tin Plates are quiet and unchanged.

Sheets are very strong and active.

Sheet Copper is in sharp demand at the higher price.

Scrap Iron is very active and higher in price.

Pig Iron is moving in large volume, with prices strong and higher.

Hardware is in active demand and prices in general rule firm.

Plumbers' Brass Goods are still unsettled as to prices and the demand tame.

Wrought Iron Pipe is active, with prospects of an early advance in price.

Solder is strong, with advancing tendency.

Wire Nails are firm and in good demand.

Cut Nails are firm, with increased demand following recent cut in price.

White Lead is more active and firmer.

METAL MARKET.

NEW YORK, February 14, 1902.

Pig Tin.—Prices have advanced about ½c. here, although London advances were considerably larger. Business, however, was very tame, with an absence of speculation, and consumers buying only in limited quantities for the satisfaction of their immediate requirements. The reason given for the comparatively small advance here is that supplies are ample and business coming from the interior is extremely small. The tone of the market, however, was very firm at the close. Jobbers quote Straits Pig in small lots at 25½c. to 26c. per lb. The total arrivals of Tin since the beginning of the month have amounted to 1380 tons..

Copper.—Manipulators and speculators are still the ruling factors in the Copper market. Their operations, however, have tamed down a good deal. They succeeded in bringing up wholesale prices for Lake Ingot to 13c., but the market since then has quieted down and is now lower. The fact that the large consumers have been filled up by the producers makes realizations on speculative holdings quite difficult, and is regarded as tending to prevent any radical advance in the near future. Jobbers quote Lake Ingot in small lots at about 13¾c. to 14c. per lb., and Casting Copper at 13½c. to 13¾c. The market here was quite dull, there being but a light demand from consumers.

Sheet Copper.—The advance of 2c. in the price of Sheet Copper made last week by the manufacturers does not seem to have unfavorably affected the demand, which is referred to as extremely heavy. Most of the mills are working to full capacity in order to keep pace with the demand from consumers. Stocks throughout the country are evidently very light, for the call is urgent for lots for spot or early future deliveries. The outlook is regarded as favorable for a large consumption of Sheet Copper during the present year. Sheet Copper in small lots from store is quoted on the basis of 18c. per lb.

Pig Lead.—This metal is firm, and some disposition is shown on the part of speculators to engage for future deliveries. The local demand seems to be of moderate proportions, although representatives of the American Smelting & Refining Company state that it is larger than usual at this season of the year. The company are now charging an additional 50c. per ton for spot Lead, and prices, as a whole, show great firmness. Jobbers quote American Pig in small lots at 4.45c. to 4½c. per lb. St. Louis advices indicate an improved tendency in the market for Pig Lead at that point, the volume of business in the past week having been on a much broader scale and prices holding firm.

Spelter.—This metal is still somewhat weak. Offers from the West came into the market in good volume, but buyers were scarce. It seems that the refiners who held back their metal in anticipation of the consolidation which was not effected are now willing, and, in fact, anxious to be relieved of their stocks. Prices show no change from last week. Good Western brands in small lots are quoted by jobbers at 4⅜c. to 4½c. per lb. The demand is of very limited proportions. St. Louis advices report an inactive tendency in that market with no change in prices.

Sheet Zinc.—The demand for Sheet Zinc is about of average volume. Jobbers quote 600-lb. cask lots at 6¾c. per lb., and smaller quantities at 7¼c.

Antimony.—There has been no change in this market. Hallett's and U. S. in small lots are quoted at 8¼c. to 8¾c., and Cookson's at 10¼c. to 10¾c. per lb.

Nickel.—The market is unchanged, small lots being quoted at about 55c. to 60c. per lb.

Aluminum.—The demand for Aluminum continues active and prices remain at the level they have held for a long time past Small lots of No. 1 Ingot, guaranteed 99 per cent. pure, are quoted at 37c. per lb., and 100-lb. lots at 35c.

Tin Plates.—There is nothing new to report in this department. A regular routine business with large consumers is being done by the American Tin Plate Company in contracts covering the first half of the year. Jobbers report a fairly active demand from the smaller consumers, which is, however, of a strictly hand to mouth character. Prices are without change. American Besemer Coke Plates, IC, 14 x 20, in small lots, delivered at New York and corresponding points, are selling at about $4.80 to $5.05 per box. A further advance of 6½ pence in the price of Welsh Plates was reported this week.

Sheets.—On account of the Steel situation it would not be surprising if there should be a material shortage in the supply of Sheets early this spring. Of course there is plenty of Sheet capacity, but the fact remains that the mills, and especially the independent concerns, are having great difficulty in getting Billets and Sheet Bars, and a number of mills are being seriously hampered in operation at the present time on this account. It does not look as if the supply of Steel will be much better within the next six months, and for this reason the trade anticipate the probability that a serious shortage in Sheets may develop before long. This has caused a decided stiffening of the market on Sheets. A large number of orders are being placed for delivery the second quarter of the year. Orders that have been held in abeyance seem to be coming forward in view of the threatened shortage. Jobbers' quotations are firm and without change, No. 27 One Pass Cold Rolled Soft Steel Sheets rule at about 3.90c. to 4c., and Galvanized Sheets at 67½ and 5 per cent. to 70 per cent. off the list.

Chicago advices are as follows: The mills are far behind in filling orders. The best delivery now named is 60 days. Quite a good demand is noted for both Black and Galvanized Sheets. Small lots of Black Sheets are selling at 3.35c. to 3.45c. Galvanized Sheets are the subject of continued sharp competition among jobbers, with the usual price 70 and 5.

Old Metals.—An extremely active demand is reported for Scrap Iron, and prices on this material have stiffened. Old Brass and Copper are also in good demand, but

prices are scarcely as high as a week ago. Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper	per lb. 10½c.
Light and Tinned Copper	per lb. 8¾c.
Heavy Brass	per lb. 8¾c.
Light Brass	per lb. 6¼c.
Lead	per lb. 3⅝c.
Tea Lead	per lb. 3½c.
Zinc	per lb. 3 c.
No. 1 Pewter	per lb. 15¾c.
No. 2 Pewter	per lb. 8 c.
Tin Plate Scrap, per gross ton	to $5.00
Wrought Iron Scrap, per gross ton	$12.00 to 12.25
Heavy Cast Scrap, per gross ton	11.25 to 11.75
Stove Plate Scrap, per gross ton	9.50 to 10.00
Burnt Iron, per gross ton	6.00 to 7.00

THE PIG IRON MARKET.

New York.—A few good sized lots have been placed in this market during the week, and there has been quite a run of moderate sized orders for delivery to New England points. The associated Southern furnaces maintain their attitude of conservatism and continue to quote $12 for No. 2, Birmingham. The January deliveries of Foundry Iron on the part of the Southern furnaces were nearly 50 per cent. greater than the make of that month of Foundry grades. We quote for Northern Irons: No. 1, $17.65 to $18; No. 2 X, $16.75 to $17.25; No. 2 Plain, $16.15 to $16.50; Tennessee and Alabama brands, No. 1 Foundry, $16.25 to $16.75; No. 2 Foundry, $15.75 to $16; No. 1 Soft, $16.25 to $16.75; No. 2 Soft, $15.75 to $16; No. 3 Foundry, $15.25 to $15.50; No. 4 Foundry, $14.75 to $15.

Chicago.—The supply of Pig Iron is exceedingly short for the first half of the year. The pressure is strong, not only for more Iron for shipment in the spring months, but also for more rapid delivery on contracts. An advance of 50c. to $1 per ton can easily be obtained on any Iron that can be delivered prior to July. Transactions during the week have been heavy. We quote as follows:

Lake Superior Charcoal	$20.00 to $21.00
Local Coke Foundry, No. 1	16.50 to 17.00
Local Coke Foundry, No. 2	16.00 to 16.50
Local Coke Foundry, No. 3	15.50 to 16.00
Local Scotch, No. 1	16.50 to 17.00
Ohio Strong Softeners, No. 1	19.50 to 20.00
Southern Silvery, according to Silicon.	16.90 to 17.15
Southern Coke, No. 1	16.40 to 16.65
Southern Coke, No. 2	15.65 to 15.90
Southern Coke, No. 3	15.15 to 15.40
Southern Coke, No. 1 Soft	16.40 to 16.65
Southern Coke, No. 2 Soft	15.65 to 15.90

Philadelphia.—Never in the history of the Iron trade have there been such conditions as prevail to-day. Everything appears to be so closely taken up that there is practically no Iron for sale. Open prices are discarded at present. February shipments of No. 2 X Foundry have been sold as high as $18, and some large lots for deliveries extending through the summer months have been taken at $17.25 to $17.50. The probable range of prices at this time for Philadelphia and nearby points is about as follows: No. 1 X Foundry, $18.25 to $18.50; No. 2 X Foundry, $17 to $18; No. 2 Plain, $16.50 to $17.

Pittsburgh.—The Pig Iron situation is as strong as it could possibly be and there is every indication that prices will go higher. Buying of all kinds is heavy and the supply is limited. Foundry Iron is very active, small foundries buying liberally and for extended delivery. We quote No. 1 Foundry at $17.25 to $17.50 and No. 2 at $16.75 to $17, f.o.b. cars Pittsburgh.

Cincinnati.—There is quite a good tonnage of Iron being sold, most of it covering deliveries in the third quarter and not a little for the fourth. The demand seems to strengthen rather than decrease, and some grades are commanding a premium. Prices are going up, and even the action of some of the larger interests in refusing to advance does not appear to be able to hold them still. With the exception of the continued trouble in making deliveries on old contracts there is not a dark spot on the whole situation. We quote, fo.b. Cincinnati:

Southern Coke, No. 1	$15.25 to $15.75
Southern Coke, No. 2	14.75 to 15.25
Southern Coke, No. 3	14.25 to 14.75
Southern Coke, No. 4	13.75 to 14.25
Southern Coke, No. 1 Soft	15.25 to 15.75
Southern Coke, No. 2 Soft	14.75 to 15.25
Southern Coke, Gray Forge	13.75 to 14.25
Southern Coke, Mottled	13.75 to 14.25
Ohio Silvery, No. 1	17.50 to 17.75
Ohio Silvery, No. 2	17.00 to 17.50
Lake Superior Coke, No. 1	18.00 to 18.35
Lake Superior Coke, No. 2	17.60 to 17.85
Lake Superior Coke, No. 3	16.35 to 16.85

St. Louis.—A very large volume of business has been transacted in Pig Iron since our last report, and owing to the scarcity prices are inclined to harden. Iron is at a premium for quick delivery, and even where extra inducements in the way of prices are offered it is difficult to secure material. The call is for all grades, and sales are well distributed through the list. We quote as follows, cash, f.o.b. St. Louis:

Southern, No. 1 Foundry	$15.75 to $16.00
Southern, No. 2 Foundry	15.25 to 15.50
Southern, No. 3 Foundry	14.75 to 15.00
Southern, No. 4 Foundry	14.25 to 14.50
No. 1 Soft	15.75 to 16.00
No. 2 Soft	15.25 to 15.50

CHICAGO REPORT.

Scrap Iron and Steel.—All prices are very strong. Little Country Scrap is now coming in. We quote dealers' buying prices for carload lots, Chicago delivery, as follows:

	Per net ton.
Country Wrought Scrap	$12.00 to $12.50
Machinery Cast	11.50 to 12.00
Malleable Cast	11.00 to 11.50
Stove Plate (free from burnt)	9.50 to 10.00
Burnt Iron and Grate Bars	6.00 to 7.00
Sheet Iron and Hoops	7.00 to 8.00
Plow Steel	9.00 to 10.00
Breaking Stock	10.00 to 10.50
No. 2, such as Shovels, Hoes, &c	.... to 7.00
Old Boilers—whole (Iron)	6.50 to 7.00
Old Boilers (Iron) cut in single Sheets and Rings	10.00 to 11.00
Old Gas Pipes and Boiler Tubes	11.00 to 11.50
Cast Borings	5.50 to 6.00
Turnings	10.50 to 11.00
Horseshoes	12.00 to 12.50

Old Metals.—Business is quite active, especially in Old Copper and Brass. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	10½c.
Copper Bottoms	9⅛c.
Copper Clips	10 c.
Red Brass	10½c.
Yellow Brass	8 c.
Red Brass Borings	9 c.
Yellow Brass Borings	7¼c.
Light Brass	6 c.
Pipe Lead	3.50c.
Tea Lead	3.25c.
Zinc	2.90c.
Tin Foil	18 c.
Pewter, No. 1	16 c.
Pewter, No. 2	14 c.
Aluminum	20 c.

Old Rubber.—Trade is still quiet. Dealers' buying prices are as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	42.50	.....
Rubber Shoes	....	6.40c.
Rubber Car Springs	....	5½c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6½c.
Black Rubber	....	4 c.
White Rubber	....	8 c.

Rags.—Dealers quote buying prices of good Country Mixed Rags, Chicago delivery, at 75c. to 85c. per 100 lbs. in any quantity.

Anthracite Coal.—The demand is strong, with small sizes in short supply. Prices are unchanged, as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis	5.75	6.00
St. Louis	6.20	6.45
Kansas City, Mo	8.25	8.50

A fire occurred on Sunday afternoon, February 2, in the nickel plating plant of the Stover Mfg. Company, Freeport, Ill., at their old works, resulting in the loss of the building and contents, amounting to about $6000 to $8000, fully covered by insurance. The origin of the fire is unknown, except that it may have resulted from an effort made in the morning by some of the men to thaw out the pipes used for heating the building. New machinery will be purchased and set up in the factory now being vacated by the removal of machinery and stock to the new plant, and for the present at least these buildings will be used as temporary quarters for the nickeling department. The fire affects the Hardware department of the business only and will not delay operations of the business outside of the nickeling department, and this only for a comparatively short time.

THE HARDWARE TRADE.

As the month advances there is no sign of a diminution in the demand or a weakening in the tone of the market. Business is moving along in large volume, and the selling of goods is a comparatively easy matter. There is an impression abroad that perhaps a good many will be in rather short supply before the season is over, and on several kinds of season goods manufacturers are already sold up, and in some cases are withdrawing quotations. Manufacturers are apparently experiencing less difficulty in getting raw material, but the condition of the Iron market is such as to make them apprehensive that there may be more trouble on this score when the trade gets more fully under way. Prices are without important change since our last review. Some consolidations to which we have called attention are under consideration, and the result will be awaited with interest. There is much less ground for complaint on the part of manufacturers in regard to the profits at which their goods are sold, most of them commanding prices which should be reasonably satisfactory. There is, however, a general disposition to be conservative in the matter of prices and not to make advances unless necessary. This comes largely from the general recognition of the fact that high prices developed by combinations, or under the stimulus of an exceptionally heavy demand, are apt to be the source of future trouble, as new competition is encouraged and the basis established for a reaction to a low level. With few exceptions the manufacturers are entitled to the commendation of the trade for the policy they have pursued in this regard. The matter of retail association is attracting much attention among this class of trade, as illustrated in the reports of the annual meetings which are contained in this issue.

NOTES ON PRICES.

Plumbers' Brass Work.—The condition of the Plumbers' Brass Work market is similar to that noted in last week's issue. The demand in the metropolitan territory is still inactive, and orders are reported to be very scarce. Prices are still unsettled, and show no signs of advancing.

Wrought Iron Pipe.—The impression prevails that an advance in the price of Wrought Iron Pipe is about to be announced. Judging from the heavy booking of orders which has taken place since the first of the month there seems to be ground for this feeling. It is said that the publication of the statement of affairs and conditions by the United States Steel Corporation has led many concerns to hasten the placing of their orders for Pipe and Tubing. The orders have been withheld by these concerns pending an assurance that prices had reached bottom. This assurance is evidently held to have been given.

Solder.—The Solder market is very strong in sympathy with the strengthening in Pig Tin. While manufacturers have not advanced their quotations, higher prices for Solder are looked for should the present level of Pig Tin values hold. Jobbers are quoting Half and Half Solder in small lots at 16½ to 17 cents, and No. 1 at 14 to 15½ cents per pound.

Rosin Sized Sheathing.—The current price on Rosin Sized Sheathing for building purposes is from $28 to $30 per ton in carloads delivered, the range of price depending on the point at which the paper must be delivered and the rate of freight for the particular territory. There is, however, some diversity in current quotations, as for example: A prominent Pennsylvania house quote $27 per ton, f.o.b. their works, York Haven, Pa., for rolls containing 500 square feet, weighing 25, 30 and 40 pounds per roll. Other quotations from concerns making competitive goods are $28.40 per ton in carload lots, New York delivery, while still another company, with works in Pennsylvania, name $29.50 per ton, f.o.b. works, in carloads, 60 days, or 2 per cent. discount 15 days.

Wire Nails.—Unfavorable weather for outside work has affected the demand for Wire Nails in the New York market to some extent. The general demand, however, has not been lessened by the recent advance of 5 cents per keg. Manufacturers report it indeed to be exceedingly active, but some mills are experiencing difficulty in securing a sufficient number of cars to make prompt shipments. The market is strong. Small lots from store, New York, are quoted at $2.25 to $2.35.

Cut Nails.—The market is firm at the recent decline of 10 cents per keg for Cut Nails. In some sections the difference in price between these and Wire Nails has stimulated the purchase of the cut. The local demand for Cut Nails is moderate, and small lots from store are quoted at $2.20 per keg.

White Lead.—White Lead in Oil is showing an improvement in the demand. The advance in the price of Pig Lead has had the effect of stiffening the market, and the possibility of a further advance in the raw material has stimulated buying. Quotations are unchanged. White Lead in Oil is quoted in moderate sized lots at 6½ to 6¾ cents per pound.

Cordage.—Rope continues comparatively light in demand, although there is considerable going from the factories in small lots. Manila Rope has stiffened in price during the week.

TRADE NOTES.

The Mfg. & Selling Company of America, with principal office at 122 Roseville avenue, Newark, N. J., have been incorporated with a capital stock of $500,000 to manufacture Iron, Steel, Zinc, &c. The incorporators are: Thomas J. Molloy, Willis G. Townes, C. P. Anderson and Samuel M. Green.

Daniel W. Baker, Jr., head of the firm of Baker & Co., Platinum Refiners and Metal Smelters of Newark, N. J., was struck by a trolley car in that city and killed on February 8, aged 40 years.

The Newport News Ship Building & Dry Dock Company, Newport News, Va., have purchased the Caskey brass foundry, in that city, which has been idle for about a year, and will put it in operation.

The American Brass Foundry Company of Hyde Park, Mass., have been incorporated with a capital stock of $7000 by A. H. Brainard, R. P. Moseley, F. H. Ambach, Cyrus Gorham, John T. McCormick and James T. Scully.

The Townley Metal & Hardware Company, Kansas City, Mo., have increased their capital stock from $100,000 to $500,000.

The Acme Metal Mfg. Company of Chicago, Ill., have been incorporated with a capital stock of $20,000 by E. C. Moran, R. Otto and W. C. Peters.

McKenna Brothers Brass Company, Limited, Pittsburgh, manufacturers of fine Brass Work, have recently bought some ground adjacent to their new works, which will be used at some time in the future for material extensions to their present plant.

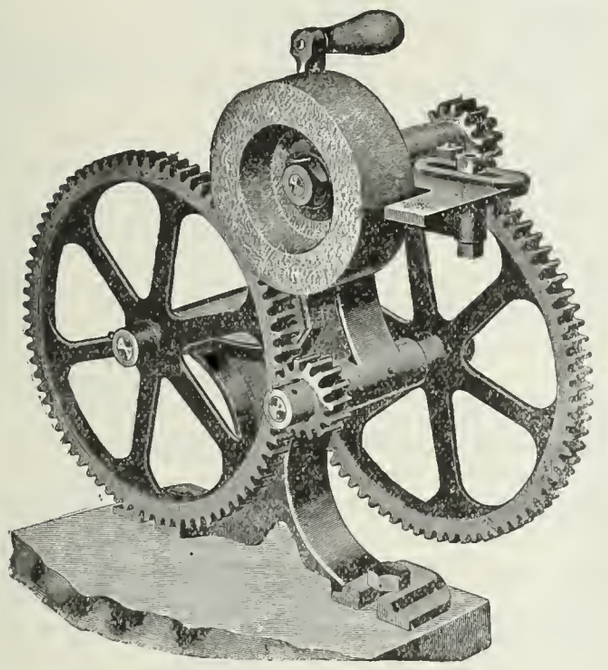
An amusing instance of "red tape" is reported from London, in the case of a coroner's inquest which has just been held in that city over a Peruvian mummy. The mummy was shipped to an English museum, and the case was opened by a customs officer, who became disturbed at the appearance of its contents and notified the authorities. The coroner held an inquest, when the following verdict was returned: "That this woman was found dead at the Railway Goods Station and did die on some date unknown and in some foreign country, from cause unknown. No proofs of violent death found and the body has been dried and buried in some foreign land, probably sundried and cave buried. The jurors are satisfied that this body does not show any recent crime in this country, and that the deceased was unknown and about 25 years of age."

United States Consul Atwell of Roubaix, France, reports that an international exposition will be held in the city of Lille between the months of May and September, 1902. It will embrace the following classes: Instruction, works of art, liberal arts, general machinery, electricity, civil engineering, transportation, wheels, automobiles, sports, agriculture, horticulture, forestry,

hunting, fishing, foodstuffs, mines and metallurgy, decoration, household furniture and accessories, yarns, dress goods, clothing, varied industrles, chemicals, sound economy, hygiene, colonization, materlal and export products, special applicatlon of alcohol as a motive force and for lighting and heating. The office of the exposltion is 35 rue National, Lille.

The Gem Shop Grinder No. 3.

A new emery grinder has just been brought out by the Chicago Wheel & Mfg. Company, 39 to 45 West Randolph street, Chicago, Ill., as herewith illustrated. It is designed for use in shops in which power is not available, and has been so constructed as to enable as much work to be done by hand as would ordinarily require considerable power. The manufacturers claim that with it as much work can be done in 15 minutes as an ordlnary grindstone would do in an hour. The wheel used in this machine is of solid emery and is 5 inches in diameter by 1½ inches thick. It is cupped on one side to afford a means of accurately grinding straight edges or surfaces, ordinary grinding being done on the face of the wheel. It is provided with a rest, which affords a support for the tool or other work, enabling the operator to grlnd accurately. The shaft on which the stone is mounted runs in a babbitted box, whlch is made in two parts, so that it may be rebabbitted when worn. The collars holding the stone in place are accurately machined to lnsure the stone running true. It is geared to a ratlo of 30 revolutions of the stone to one of the crank, whlch enables a very high speed to be reached, the average revolutions per minute being easily 2800. The dlameter of the circle described by the handle is 14 inches. The size of the large gears is 10 inches by ¾ inch, and of the small gears 2 inches by ¾ inch. The dlmenslons of the machine are 15 x 17 x 12 inches, and its weight ls 30 pounds.



The Gem Shop Grinder No. 3.

Galvanic Coloring of Metals.

In an abstract by *Lightning* of an article in *L'Electrochemie* on the coloration and protection of metals, a large number of receipts are given. Gilding on steel is imitated by galvanically coating with copper from cyanlde bath, then with a thin film of zinc. After drying and polishing, thc article is heated in linseed oil to 320 degrees F., when it is stated that the surface becomes of a red brass color, as if there had been a real alloying of the copper and the zinc. Iron can be protected from rust by a layer of molybdenum, deposited from a bath containing 1 gram of ammonium molybdate and 15 to 20 grams of ammonium nitrate per liter, with a current of 2 to 5 amperes per square decimeter. All varieties of iron can be covered with an adherent and unalterable deposit of peroxide of manganese by making them anodes in a bath containing about 0.05 per cent. of manganous chloride or sulphate, with 5 to 25 per cent. of ammonium nitrate, the bath being cold, the cathodes of carbon, using a weak current of 1 to 2 amperes. Selenite of copper is rccommended for coloring iron and steel brilliant black or blue-black, according to the strength; the layer, after firing, is very permanent. The bath is made with selenious acid, 6 to 10; copper sulphate, 10; nitric acid, 4 to 6, to the liter of water. It can be also used for copper and brass with feeble currents. Mathey colors watch hands and other small metal articles with gold or platinum, but not with silver, by placing them on an anode plate under about 3 cm. of solution, and dipping the cathode into the liquid over them until the required tint is produced.

THE new galvanizing works of the Lalance & Grosjean Mfg. Company that are being erected in connection with their factory at Woodhaven, L. I., are now under roof and are only waiting for some of the galvanizing pots before they are started. It is expected that the new department will be in operation next month.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED FEBRUARY 14, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 37¢
100-lb lots.....₩ lb, 35¢

Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

	Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.	
		₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19.....	$0.42	$0.44	$0.47	
" 20.....	.44	.46	.49	
" 21 to 23.....	.46	.48	.51	
" 24.....	.46	.50	.53	
" 25.....	.47	.51	.54	
" 26.....	.47	.54	.59	
" 27.....	.48	.57	.62	
" 28.....	.48	.57	.64	
" 29.....	.49	.60	.69	
" 30.....	.50	.64	.77	

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb. 10½@10¾¢
Hallett's.....₩ lb, 8¼@8½¢
U. S.....₩ lb 8¼@8½¢

Brass, Roll and Sheet..... 30%

Conductors—Corrugated.

Round or Square.—

Galvanized ½ or more. N'st'd.....70&5%
" Not Nested.....70&2½%
" Plain Round, ½ or more, Nested.....70&5%
Galvanized, Plain Round, Not Nested. 70&2½%

Spiral Riveted.

Galvanized.....40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—

See *Strainers, Conductor.*

Copper—

Lake Ingot.....13¾@14 ¢
Casting.....13½@13¾¢
Sheet and Bolt.....18¢ ₩ lb basis
Cold Rolled Sheets.....19¢ ₩ lb basis
Cold Rolled and Polished Sheets.....20¢ basis
Planished Sheets.....21¢ basis
Bottoms, Pits and Flats....₩ lb 22¢ basis

Eave Trough, Galvanized

Territory.	L. C. L.
Eastern	75&10%
Central	75&7½%
Southern	70&12½%
S. Western	70&10%

Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Eastern List.

Tin.....80%
Galvanized.....80%
Perfect Elbows.....40%

Stove Pipe—

Four-Piece

	4	4½	5	5½	6-inch.
No. 1.	$0.80	.85	.90	1.00	1.05 per doz.
No. 2.	.65	.70	.75	.80	.85 "
No. 3.	.60	.63	.65	.70	.80 "

Elbows and Shoes—

Galvanized.....60%

Gasoline—

See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, Soft Steel.	C. R.,	R. G. Cleaned.
Nos. 14 to 16....	₩ lb. 3.60....		3.85¢
Nos. 18 to 21....	₩ lb, 3.70....		3.75¢
Nos. 22 to 24....	₩ lb, 3.80....		3.85¢
Nos. 25 and 26...	₩ lb, 3.90....		3.95¢
No. 27 ...	₩ lb, 4.00....		4.05¢
No. 28 ...	₩ lb, 4.10....		4.15¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb 11@14 ¢
Do. Stained.....6@10½¢
Patent Planished. ₩ lb A, 12¢; B, 11¢ net

Galvanized.

Nos. 10 to 16	₩ lb, 12¢	67½&5&67½% off
Nos. 17 to 21	₩ lb, 13¢	
Nos. 22 to 24	₩ lb, 14¢	
Nos. 25 to 26	₩ lb, 15¢	
No. 27	₩ lb, 16¢	
No. 28	₩ lb, 17¢	
No. 29	₩ lb, 19¢	
No. 30	₩ lb, 21¢	

86 in. 1¢ ₩ lb higher.

Lead—

American Pig.....4.45@4¼¢
Bar.....5@5¼¢
Pipe.....6½¢.....20% off
Tin Lined Pipe.....12½¢.....20% off
Block Tin Pipe.....35 ¢.....20% off
Sheet Lead.....7½¢.....20% off
Old Lead in exchange, 3½¢ ₩ lb.

Mitres, Eave Trough—

See *Eave Trough Mitres.*

Nickel—

Per lb.....60@65¢

Paints, Oils, &c.—Leads—

Lead, American White, in Oil:
Lots of 500 lb or over.....6¼ @ 6½
Lots less than 500 lb.....6¾ @ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price..... @ ¼
Lead, White, in oil, 12½ lb tin pails, add to keg price..... @ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price... @ 1½
Lead, White, Dry in bbls.....5¾ @ 6
Lead, Red, bbls., ½ bbls. and kegs:
Lots 500 lb or over..... @ 6
Lots less than 500 lb..... @ 6¼

Oils—

Linseed, City, raw.....₩ gal.....63@64¢
Linseed, City, boiled.....65@66¢
Linseed State and West'n, raw..62@63¢

Spirits Turpentine—

In Southern bbls.....45 @45½¢
In machine bbls.....46 @46½¢

Putty—

In bulk.....$1.25
In bladders.....2.25
In cans 12 lb to 25 lb.....2.25
In cans 1 lb to 5 lb.....3.25

Petroleum Products—

In Barrels (Barrel Included)

Stove Gasoline.....₩ gal. 10½@11¢
Kerosene.....₩ gal. 12@13¢

Pipe, Drain.....40%

Pipe, Spiral—

See *Conductors.*

Registers—

List Sept. 2, 1901.

Black Japanned.....60&10@60&10&5%
White Japanned.....60&10@60&10&5%
Nickel Plated.....60&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....60&10@60&10&5%
Electroplated in Brass, Bronze or Copper.....60&10@60&10&5%
White Porcelain.....60%
Solid Brass and Bronze Metal.....50%

Roofing Material—

1 Ply Tarred Paper. ₩ ton. $30.00@31.00
2 Ply Tarred Paper...₩ roll, 108 sq. ft. 50@55¢
3 Ply Tarred Paper..₩ roll, 108 sq. ft. 70@75¢
Slater's Felt.....roll 500 sq. ft., 50@60¢
Roofing Pitch.....₩ bbl. $2.35

Rosin—

Common and Good—Strained.

Rosin, C. & D.....₩ bbl. $1.55 @$1.60
Rosin, E. & F.....₩ bbl. 1.60 @ 1.65
Rosin, G. & H.....₩ bbl. 1.70 @ 1.75
Rosin, I. & K.....₩ bbl. 1.95 @ 2.60
Rosin, M. & N.....₩ bbl. 3.00 @ 3.60

Shoes and Elbows—

See *Elbows and Shoes.*

Slate Roofing—

f. o. b. cars, Quarry Station.

	According to size.
Pennsylvania:	
Best Bangor, ₩ sqr.	$3.25@$4.50
No. 1 Bangor Ribbon, ₩ sq	3.00@ 3.50
Pen Argyle, ₩ sqr.	3.00@ 3.75
Peach Bottom, ₩ sqr.	4.35@ 5.60
No. 1 Boys, ₩ sqr.	3.35@ 3.55
No. 1 Obapman Keystone, ₩ sqr.	3.25@ 4.25
Vermont:	
Sea Green, ₩ sqr.	$3.00@$3.23
Purple, ₩ sqr.	3.75@ 4.25
Unfading Green, ₩ sqr.	3.25@ 4.50
Red, ₩ sqr	7.00@11.00
Maine:	
Brownville, Unfading Black:	
No. 1 quality.	$5.25@7.50
No. 2 quality.	$4.25@6.00

Solder—

½&½ guaranteed.....16½@17¢
No. 1.....14@15½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	Per Pound. Barrels	Smaller Q'ntities
Concentrated Flux	4c	5c
Eureka Flux:		
Triple Strength	3c	3½c
Extra Concentrated	4½c	5c
Crystal	"	7c
Gedney's Fluid	2c	2c
Lennox Fluid	2c	3c
Perfection Flux	3c	3½@4c
Yager's Salts, 1 lb. bottles		each, 50¢
5 lb. bottles, per lb., 45¢		

Soldering Coppers—

Per lb.....20@22¢

Spelter—

Western Spelter.....4½@4¾¢

Spiral Pipe—

See *Conductors.*

Stove Pipe Elbows—

See *Elbows, Stove Pipe.*

Stove Trucks—

See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....50%

Tin Pigs and Bars—

Banca, pigs, ₩ lb.....25½@26 ¢
Straits, pigs, ₩ lb.....25½@26 ¢
Straits, in bars, ₩ lb.....26½@27 ¢

Tin Plates, American Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:
IC, 14 x 20.....$7.50
IX, 14 x 20.....9.00
IXX, 14 x 20.....10.25
IXXX, 14 x 20.....11.50
IXXXX, 14 x 20.....12.75

Melyn Grade:
IC, 14 x 20.....7.00
IX, 14 x 20.....8.50
IXX, 14 x 20.....9.75
IXXX, 14 x 20.....11.00
IXXXX 14 x 20.....12.25

Allaway Grade:
IC, 14 x 20.....8.50
IX, 14 x 20.....7.80
IXX, 14 x 20.....8.70
IXXX, 14 x 20.....9.80
IXXXX, 14 x 20.....10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight: IC, 14 x 20.....$5.00@5.25
" IX, 14 x 20.....$6.00@6.25

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates—

N. B.—The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance for 8 to 10 lb coating and $2.50 to $3 advance for 15 lb and upward.

About 40 lb coating.....$16.00@16.50
About 30 lb coating.....15.25@15.75
About 20 lb coating.....13.25@13.75
About 15 lb coating.....11.25@11.75
About 8 lb coating.....10.00@10.00

Boiler Plates, American—

IXX, 14 x 26..(112 sheets).....$12.50
IXX, 14 x 28..(112 sheets).....13.50
IXX, 14 x 31..(112 sheets).....15.00

Troughs, Eave—

See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved pattern, ₩ doz...18.00

Tubes and Tubing—

Brazed Brass, List June 6, 1898.....40%
Copper and Bronze, 8c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb. 6, 1899
Tin.....50%
Galvanized.....50%
Fittings for do.....40%

Zinc—

600 lb casks ₩ lb.....6¾¢
Per lb.....7¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
30 gal.....70&10%
35 and 40 gal.....70%
Other sizes up to 52 gal....60@60&10%
52 gal. and above.....60%
Extra Heavy Boilers:
18 to 52 gal.....60%
53 gal. and above.....55%

Brass Work, Plumbers'—

List of December 7, 1896.

Compression:
Basin Cocks.....65%
Bath Cocks and Double Bath Cocks.....65%
Bibs.....65%
Bibs, Flanged.....65%
Fuller:
Bibs.....70%
Basin Cocks, Nos. 1 to 4.....70%
Bath Cocks, No. 4½.....$2.40 each net
Ground Key Work:
Finished Bibs.....55&5%
Rough Bibs.....70%
Rough Stop and Stop and Waste Cocks.....70@70&5%
Rough Stop and Stop and Waste Cocks, Patented.....65@65&5%

Miscellaneous—

Basin Clamps.....60@65%
Basin Plugs.....60@65%
Chain Stays.....60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face.	₩ set $0.95	$1.05
Ground Face	₩ set $1.00	$1.10

Sink or Bath and Wash Tray Plugs.60@65%
Soldering Nipples.....70&5@75%
Soldering Unions.....70&5@75%
Union Elbows, Hot Water Heating.....75@75&15%

Cocks, Valves, &c.—Cocks—Brass—

Air and Radiator Air.....75@75&5%
Gas Meter and Union Meter.....65@70%
Steam.....65@70%

Iron—

All Iron.....70@70&10%
Iron with Brass Plugs.....65@70%

Valves—Brass—

Check.....65@70%
Garden Hose.....65&10@70%
Gate.....65@65&10%
Globe and Angle, hose outlet.65@65&10%
Globe, Angle and Cross...65&10@70&5%
Horizontal, Vertical and Angle Check...65@65&10%
Hot Water Radiator.....75%
Radiator.....70&10%
Safety.....65%
Safety, Low Pressure.....65%
Jenkins' Disc:
Check.....65%
Gate.....55%
Globe, Angle and Cross.....70%
Radiator.....80%
Radiator, Corner.....75%
Safety.....65%

Iron—

Iron Body.....70@70&5%
Foot.....65@70%
Jenkins Bros.':
All Iron, except Gate.....40&5%
All Iron Gate.....35@40%
Iron Body, except Gate.....60%
Iron Body Gate.....50@50&5%
Swing Check.....50%

Earthenware—

Brown Glazed Wash Tubs.....20%
Brown Glazed Sinks, Kitchen and Pantry.....20%
Basins, Urinals and Hoppers.....45%
Closet Bowls, Sundries, Washouts and Pedestals.....50%

Fittings—Brass Fittings—

Finished.....70@75%
Rough.....70@75%
Bushings.....70@75%
Nipples.....70@70&2½%
Unions, Rough and Finished....70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....65@70%
Cast Iron Bushings and Plugs.....65@75%
Cast Iron Flanges.....65@70%
Cast Iron Floor Flanges.....65@75%
Malleable Iron Fittings.....70@75%
" " Bushings.....70@70&10%
" " Unions.....70&10@75%
" " Unions, Flange 60&10@70%
" " Pipe Hangers, Universal 50%
Wrought Iron Nipples.....70@75%
" " Couplings.....60@65%
" " Long Screws.....60@65%

Lavatories—

Porcelain Enameled Iron.....80@80&10%

Oakum—

Plumbers' Oakum, 50 lb. bales, ₩ lb 2½¢

Pipe—Brass, Iron Pipe Size—

⅛	¼	⅜	½ to 3 Inch
$0.38	.31	.29	.23 ₩ ft

Cast Iron Soil—

List Feb. 25, 1901.
2 to 6 inch inclusive.

Standard.....60&5%
Extra Heavy.....65@70%
All Fittings.....70@70&10%

Wrought Iron—

List Feb. 15, 1900.

	Black.	Galv.
⅛ to ⅓ inch	57%	48%
¼ to 12 inch	64%	51%

NOTE.—*Manufacturers' prices are much lower than above, but prompt shipments are not obtainable.*

Radiators—Standard List.

Steam.....50&2½%
Hot Water.....60%

Sinks, Etc.—

	Cast Iron—Black.	Galv.
Sinks, Square, Half Round and Corner	60@65%	60@65%
Sink Legs	60%	60@65%
Sink Backs	60%	60@65%
Boiler Stands, Cast Iron	60@60&10%	
Cesspools, Cast Iron	60%	

Wrought Steel Sinks—

New Era, Galv'd and Enameled...70&5%
New Era, Painted.....50&10%
L. & G.....50%

Traps—

Drawn Lead Traps, List June 8, 1901.....55&55&5%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns, Guaranteed, 45@50%
All Special Patterns.....25%
Non-Guaranteed Brands, complete line.....45@50%
Solid Copper, list of Feb. 1, 1899.....40%
Solid Porcelain—Class A, 30%: B, 40%: C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899.....50@55%

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Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Reeves Mfg. Co., Canal Dover, O.

Eave Trough Hangers.
Berger Bros. Co., Phila., Pa.
Berger Mfg. Co., Canton, O.

Elbows, Stove Pipe.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Emery Wheels.
Scranton Corundum & Emery Wheel Co., Scranton, Pa.

Enameled Ware.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Exhausters.
American Blower Co., Detroit, Mich.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Fire Pots.
Clayton & Lambert Mfg. Co., Detroit, Mich.
Wolff, L. Mfg. Co., Chicago, Ill.

Fire Sets.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Forming Machines.
Pocock, Oliver, Cincinnati, O.

Furnace Cement.
Rutland Fire Clay Co., Rutland, Vt.

Furnace Pipe and Fittings.
International Heater Co., Utica, N. Y.
Osborn, J. M. & L. A., Cleveland, O.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Brand Stove Co., Milwaukee, Wis.
Brien Heater Co., Hoosick Falls, N. Y.
Dighton Furnace Co., Taunton, Mass.
Floyd, Wells & Co., Royersford, Pa.
Front Rank Steel Furnace Co., St. Louis, Mo.
Hart & Crouse Co., Utica, N. Y.
Hess-Snyder Company, Massillon, Ohio.
International Heater Co., Utica, N. Y.
Kelsey Heating Co., Syracuse, N. Y.
Lennox Manufacturing Co., Marshalltown, Iowa.
Magee Furnace Co., Boston, Mass.
Mueller, L. J. Furnace Co., Milwaukee, Wis.
Peck-Williamson Co., Cincinnati, O.
Richmond Stove Co., Norwich, Conn.
Robinson Furnace Co., Chicago, Ill.
Schwab, R. J. & Sons Co., Milwaukee, Wis.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Ct.
Stanton Heater Co., Martins Ferry, O.
Thatcher Furnace Co., 240 Water St., N. Y.

Gas Heaters. *(See Stoves and Ranges. Gas.)*

Gas Machines.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Granite Steel Ware.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Groovers.
Poorman Mfg. Co., Piqua, O.
Wheeler, W. A., Indianapolis, Ind.

Gutter Formers.
Double Truss Cornice Brake Co., Buffalo, N. Y.

Heat Regulators.
Æolipyle Co., 117 Beekman St., N. Y.
Howard Thermostat Co., Oswego, N. Y.

Heaters, Steam and Hot Water.
Barstow Stove Co., Providence, R. I.
Dighton Furnace Co., Taunton, Mass.
Drake, W. H., Newark, N. J.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Gurney & Co., Boston, Mass.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
International Heater Co., Utica, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Magee Furnace Co., Boston, Mass.
Mueller, L. J. Furnace Co., Milwaukee, Wis.
National Pipe Bending Co., New Haven, Conn.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.
Richmond Stove Co., Norwich, Conn.
Sheppard, Isaac A. & Co., Phila., Pa.
Smith, H. B. Co., Westfield, Mass.
Smith & Anthony Co., Boston, Mass.
Stolz, Frank D., Chicago, Ill.
Thatcher Furnace Co., 240 Water St., N. Y.
Vance Boiler Works, Geneva, N. Y.
Wireton Heating Co., Blue Island, Ill.

Hollow Ware.
National Enameling & Stamping Co., 78 Beekman St., N. Y.
Sperry, D. R. & Co., Batavia, Ill.

Hotel Cooking Apparatus.
Smith & Anthony Co., Boston, Mass.

Ice Cream Dishers.
Clad, V. & Sons, Philadelphia, Pa.
Seavey Mfg. Co., Boston, Mass.

Ice Cream Freezers.
White Mountain Freezer Co., Nashua, N. H.

Iron, Galvanized Sheet. *(See Sheets, Galvanized.)*

Iron and Steel, Sheet. *(See Sheets, Iron and Steel.)*

Iron, Planished Sheet.
Amer. Sheet Steel Co., New York.

Iron Shutters and Doors.
Garry Iron & Steel Co., Cleveland, O.

Lath, Metallic.
Schratwiesers Metal Lath Works.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Lunch Boxes.
Seavey Mfg. Co., Boston, Mass.

Manufacturing Sites.
Chamber of Commerce, Muskegon, Mich.

Metal Ceilings. *(See Ceilings, Metallic.)*

Mica.
Asheville Mica Co., Asheville, N. C.
Munsell, Eugene & Co., 218 Water St., New York.
Ohio Mica Co., Canton, Ohio.
Palermo Mica Co., 115 Beekman St., N. Y.
Rutland Fire Clay Co., Rutland, Vt.

Milk Cans.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Oil Heaters. *(See Stoves and Ranges, Oil, Vapor and Gasoline.)*

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Blodgett, G. S. Co., Burlington, Vt.
Monarch Stove & Mfg. Co., Mansfield, Ohio.

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Howson & Howson, Philadelphia, Pa.
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Saunders, D. Sons, Yonkers, N. Y.

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Iwan Bros., Streator, Ill.

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Callahan, Geo. & Co., 218 Front Street, N. Y.

Pipe Vises.
Walworth Mfg. Co., Boston, Mass.

Pipe, Water and Gas.
Millar, C. & Son Co., Utica, N. Y.

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Trimont Mfg. Co., Roxbury, Mass.

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Walworth Mfg. Co., Boston, Mass.
Wolff, L. Mfg. Co., Chicago, Ill.
Young, Jos. H., Boston, Mass.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

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Niagara Machine & Tool Wks., Buffalo, N. Y.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.

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Hess-Snyder Company, Massillon, Ohio.
Lawless, John H., Jersey City, N. J.

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Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
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Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.

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Koven, L. O. & Bro., 50 Cliff St., N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

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Cooper & McKee, Brooklyn, N. Y.
Gurney Refrigerator Co., Fond du Lac, Wis.
Illinois Refrigerator Co., Morrison, Ill.

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Canton Steel Roofing Co., Canton, O.
Dighton Furnace Co., Taunton, Mass.
Independent Register Co., Cleveland, Ohio.
Seavey Mfg. Co., Boston, Mass.

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Dixon, Jos. Crucible Co., Jersey City, N. J.
Rutland Fire Clay Co., Rutland, Vt.

Roofing Cork.
Stowell Mfg. Co., Jersey City, N. J.

Roofing Edger.
Danzer Metal Works, Hagerstown, Md.

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Burton, W. J. & Co., Detroit, Mich.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Reeves Mfg. Co., Canal Dover, O.

Roofing Nails.
Salem Nail Co., 379 Pearl St., N. Y.

Roofing Slate.
Bray, J. & Co., E. Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Genuine Bangor Slate Co., Easton, Pa.
Johnson, E. J. & Co., 33 Park Row, N. Y.
O'Halloran & Jacobs, Pittsburgh, Pa.

Sap Spouts.
Millar, C. & Son Co., Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.

Screens.
Harrington & King Perforating Co., Chicago, Ill.

Sewer Pipe.
Rutland Fire Clay Co., Rutland, Vt.

Shears, Sheet Metal
McSherry, Chas., Pittsburgh, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y
Keene Geo. C. & Co., Cincinnati, O.

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Miner & Peck Mfg. Co.. New Haven, Conn.
Niagara Machine & Tool Wks.. Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Porock, O., Cincinnati, O.
Poorman Mfg. Co., Piqua, O.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Stiles & Parker Press Co., Brooklyn, N. Y.

Sheets. Galvanized.
American Sheet Steel Co.. New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
McClure & Co., Pittsburgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Alan Co., Philadelphia. Pa.

Sheets. Iron and Steel.
American Sheet Steel Co., New York.
Bruce & Cook. 186 to 190 Water St., N. Y.
Coe, Jas. A. & Co., Newark, N. J.
Follanshee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Co.. Alan, Philadelphia, Pa.

Shingles and Tiles, Metallic.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.
Colwell Lead Co., 68 Centre St., N. Y.

Siding. *(See Roofing and Siding.)*

Skylights.
Canton Steel Roofing Co., Canton, O.
Dronve, G. Co., Bridgeport, Conn.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 279 Pearl St., N. Y.

Snow Guards.
Clason Arch. Metal Works, Providence, R. I.

Solder.
Bruce & Cook, 186 to 190 Water St., NY
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties. Sheet Metal.
Vogel, Wm. & Bros., Brooklyn, N. Y.

Steam and Gas Fitters' Supplies.
Curtis & Curtis Co., Bridgeport, Conn.
Walworth Mfg. Co., Boston, Mass.

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Kieley & Mueller, 7-11 West 13th St., N. Y.

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Cambridge Rolling Mill Co., Cambridge, Ohio.

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Schwerdtle Stamp Co., Bridgeport, Ct.

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Kirk Mfg. Co., Toledo, O.

Stove Cement.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Rutland Fire Clay Co., Rutland, Vt.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
Maroy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Tannton, Mass.

Stove and Metal Polish.
Hoffman, Geo. W., Indianapolis, Ind.
Rutland Fire Clay Co., Rutland, Vt.

Stove Patterns.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Milwaukee Pattern Works, Milwaukee, Wis.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
O. K. Mfg. Co., Buffalo, N. Y.

Stove Repairs.
Clark, Henry N. Co., Boston, Mass.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Arcade Mfg. Co., Freeport, Ill.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

Stoves and Ranges.
Barstow Stove Co., Providence, R. I
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Brand Stove Co Milwaukee, Wis.
Champion Steel Range Co., Cleveland, Ohio.
Detroit Stove Works, Detroit, Mich.
Dighton Furnace Co., Taunton, Mass
Eclipse Stove Co., Mansfield, O.
Enterprise Stove Co., Vincennes, Ind.
Floyd, Wells & Co., Royersford, Pa.
Fuller & Warren Co., Troy, N. Y.
Gurney & Co., Boston, Mass.
Hess-Snyder Company, Massillon, O.
Joliet Stove Works, Joliet, Ill.
Magee Furnace Co., Boston, Mass
Quincy Fdry. & Novelty Co., Quincy, Ill.
Richmond Stove Co., Norwich, Conn.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenksmp Co., Cleveland, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Smith & Anthony Co., Boston, Mass.
Stamford Foundry Co., Stamford, Ct.
Thatcher Furnace Co., 240 Water St., N. Y.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass

Stoves and Ranges, Gas.
Adler H. & Co., Pittsburgh, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Dangler Stove & Mfg. Co., Cleveland, Ohio.
Detroit Stove Works, Detroit, Mich.
Dighton Furnace Co., Taunton, Mass.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Stoves and Ranges, Oil, Vapor and Gasoline.
Clark, Geo. M. & Co., Chicago, Ill.
Daugler Stove & Mfg. Co., Cleveland, Ohio.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
National Vapor Stove & Mfg. Co. Lorain, O.
Ringen Stove Co., St Louis, Mo.
Schneider & Trenkamp Co., Cleveland, O
Standard Lighting Co., Cleveland, O.

Street Lamps, Gasolene.
Merkel, H., St. Louis, Mo.

Tanks, Steel and Wood.
Edwards, J. H., 59 Park Place, N. Y.

Terne Plates.
American Tin Plate Co., New York.
Taylor, N. & G. Co., Phila., Pa

Tinners' Tools, Machines and Supplies.
Berger Bros. Co., Phila., Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn N. Y.
Weiss, H. & Co., 20 Cliff St., N. Y.

Tinners' Trimmings.
Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate.
American Tin Plate Co., New York.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follanshee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

Tin Scrap.
Vulcan Metal Refining Co., 157 Cedar St., N. Y.
Vulcan Western Co., Streator, Ill.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn
Curtis & Curtis Co., Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Torches. Plumbers.
Clayton & Lambert Mfg. Co., Detroit, Mich.

Tubing.
Kirk Mfg. Co., Toledo, O.

Valves.
Am. Steam Gage & Valve Mfg. Co., Boston, Mass.
Crosby Steam Gage & Valve Co., Boston, Mass.
Jenkins Bros., 71 John St., New York.
Morgan & Co., Chicago.

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American Blower Co., Detroit, Mich.

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Iwan Bros., Streator, Ill.

Ventilators and Chimney Caps.
Berger Bros. Co., Phila., Pa.
Dowman Mfg. Co., Atlanta, Ga.
Fenn, Geo. E., Boston Mass.
Globe Ventilator Co., Troy, N. Y.
Kramer Bros., Dayton, O.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Marston, I. G. & Co., Boston, Mass,

Washing Machines.
Wayne Anthony Mfg. Co., Ft. Wayne, Ind.

Water Coolers.
National Enameling & Stamping Co., 78 Beekman St., N. Y

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Water Fronts.
Clark, Henry N. Co., Boston, Mass.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.
Miner & Peck Mfg. Co., New Haven, Ct.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Official letters of reference should not be inclosed with replies to advertisements appearing in these columns as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

A first-class SALESMAN to sell high grade stoves and ranges on commission in all or part of New England and Southern New York; liberal compensation paid to right party; would give line to strictly first-class man as side line. Address at once, "Competent," care *The Metal Worker*, New York. Feb. 15

A first-class TINSMITH; must be a thorough mechanic and able to handle heavy galvanized iron work and have experience in furnace work; steady work and good wages to right man. F. E. Newman, Johnstown, Pa. Feb. 15

At once, a good, sober, steady, all around PLUMBER and TINNER; one who can do all work that comes to a country shop; wages $2.50 per day; steady every day in the year. Geo. W. Gibney, Pawling, N. Y. Feb. 15

SHEET METAL WORKERS; steady work for reliable men. U. S. Headlight Company, Buffalo, N. Y. Feb. 15

A first-class PLUMBER, STEAM and HOT WATER FITTER; must understand tin and furnace work; must have good habits; married; steady work the year through and good pay to the right man. Zimmerlin Bros., Lyons, N. Y. Feb. 15

A first-class SALESMAN to represent a good selling, modern line of stoves, ranges and furnaces in Eastern Pennsylvania. "Esstern Pennsylvania," care *The Metal Worker*, New York. Feb. 15

A good all around TINNER and SHEET IRON WORKER; must be sober and honest; state age, experience and wages wanted: steady work the year round to the right man Box 15, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 15

Two or three first-class WARM AIR FURNACE TINNERS and INSTALLERS; must be strictly first-class, sober men, or applications will not be considered. The Stanton Heater Company, Martin's Ferry, Ohio.

STOVE SALESMAN wanted to travel in Eastern territory; good salary to the right man. "Eastern Stove Salesman," care *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Feb. 15

A competent CHANDELIER MAKER to take charge of a small shop; state experience and reference; a steady and permanent job to the right man. "Chandeliers," care *The Metal Worker*, Hamilton Building, Pittsburgh, Pa. Feb. 15

SIDE LINES; liberal commission; quick sellers to hardware and furniture trade; only experienced salesmen with established trade need apply; state territory covered. "B. S. Company," 859 Rose Building, Cleveland, Ohio. Feb. 15

Wanted at once, several good SHEET IRON WORKERS as road mechanics; those used to erecting blow pipe work preferred; state age, wages expected and where last employed; none but good mechanics need apply. The Ohio Blow Pipe Company, corner Seneca and Michigan streets, Cleveland, Ohio. Feb. 15

FOUNDRY SUPERINTENDENT with knowledge of molding; must have executive ability to manage men and get work out to advantage: special experience in our line of work not required; state experience, age and references; good position and salary for right man. Richmond Stove Company, Norwich, Conn. Feb. 8

A first-class, steady and sober TINSMITH; must be fast on wash boilers and good on bakers' and confectioners' supplies; wages from $2.50 to $3 per day to the right man; must come to Washington at once. J. Melncove, 1311 Seventh street, N. W., Washington, D. C. Feb. 8

A FOREMAN to take charge of pieced tinware department in sheet metal goods factory; must know how to make good tinware; state experience and salary expected. Address Box 11, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 8

As ASSISTANT SUPERINTENDENT of a stove concern, a man between 35 and 45 years of age, who has had experience of the mounting, nickel plating and general finishing of stoves and furnaces. Apply, giving testimonials and stating salary, to the Gurney Foundry Company, Toronto, Can. Feb. 8

A first-class man, with good references, to take charge of our casting department; steady job to the right man. F. & L. Kahn & Bros., Hamilton, Ohio. Feb. 8

A first-class PLUMBER and TINSMITH; no other need apply; state wages. John H. Newbury, Bay Shore, N. Y. Feb. 8

A first-class TINNER for inside and outside work; one that has knowledge of plumbing; must be strictly temperate; none but first-class mechanic need apply; steady position to the right man. C. B. Hodges, Depew, N. Y. Feb. 8

A WORKING FOREMAN to take charge of a tin and cornice shop; must be capable of detailing, cutting and constructing galvanized iron cornice and skylights, tin roofing, job work and hot air heating; state age and what wages wanted; steady work to the right man; must be temperate. S. M. Subers' Son, 205 Cotton avenue, Macon, Ga. Feb. 8

An all around TINNER, STOVE and FURNACE MAN that has some knowledge of plumbing; must be strictly temperate while about his business; steady job to the right man; state salary wanted. Jno. S. Solenberger & Co., Winchester, Va. Feb. 8

A first-class TINNER for inside and outside work; one that can do some slating preferred; good wages and steady work to the right party. Humphrey Brothers, Greenville, Ohio. Feb. 8

First-class PLUMBER with a fair knowledge of steam and hot water fitting; good pay and steady work to the right man. Willey & Calhoun, Portland, Me. Feb. 8

Industrious SHEET IRON WORKER, with some knowledge of plumbing; able to take an interest in the hardware business; send full particulars. G. Roene, Douglas City, Alaska. Feb. 8

At once, two TINNERS, all around first-class men; $2.50 per day, nine hours. Walter Tillson, 14 North Joachim street, Mobile, Ala. Feb. 8

Experienced man to take charge of cornice, skylight and roofing shop in New York City; must be capable of handling a large number of men; good position to the right man; state age, reference and wages desired. "F. B.," care *The Metal Worker*, New York. Feb. 8

SITUATIONS WANTED.

By a first-class PLUMBER, GAS and STEAM FITTER; can do all ordinary tin work; can figure and take charge of work; 16 years' experience; would like steady work. "Fitter," Sistersville, W. Va. Feb. 15

PLUMBER wants steady employment; good, quick worker; city or country; Western Pennsylvania preferred; first-class on lead work and up to date on sanitary matters; sober and best of reference as to my character and ability. "J. S.," plumber, 421 West Thirty-second street, New York. Feb. 15

By first-class steam fitter as FITTER, ESTIMATOR or WORKING FOREMAN; some experience at soliciting; moderate wages. Robert Doyle, 106 West Sixty-first street, New York. Feb. 15

By SHEET METAL WORKER and general jobber at inside and outside work; 20 years' experience; steady position in country desired. Chas. Willis, 428 West Eighteenth street, New York. Feb. 15

As FOREMAN, CUTTER or BENCH WORKER in cornice and skylight shop; in or outside work; German; first-class worker. Adolf Klein, 403 East Eleventh street, New York. Feb. 15

By a good CORNICE CUTTER and DRAFTSMAN; practical and reliable; can take charge of shop, handle men and estimate from plans. "H. D.," care *The Metal Worker* 117-119 South Fourth street, Philadelphia, Pa. Feb. 15

By a first-class PLUMBER; 18 years' experience; will work anywhere. Joseph Reilly, 412 West Thirty-second street, New York. Feb. 15

Having had 12 years' experience in steam, water and gas fitters' supply business, would like to make contract to represent reputable concern in territory from Philadelphia to Norfolk. "B. Z.," care *The Metal Worker*, New York. Feb. 15

By a TIN and SHEET IRON WORKER, any kind of work, piece or day or general jobbing shop. "Smith," 284 Third avenue, New York. Feb. 15

As CLERK in retail hardware or stove store; ten years' experience: can furnish best of references; would like position by March 1. "Clerk," care *The Metal Worker*, New York. Feb. 15

Side line, by first-class SALESMAN who calls on the stove and hardware trade from Chicago to Atlantic Coast; in position to command good trade. "Stove Man," care *The Metal Worker*, New York. Feb. 15

By an A1 man in the tinware manufacturing business as SUPERINTENDENT; 30 years of age, wide awake and a head full of new ideas; can keep men in good temper yet manage to get their highest efficiency; desire answers from large manufacturing firms that are reliable, able and willing to pay good salary for a good man; can furnish good references. Box 16, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 15

By STEEL RANGE and COOK WORKING FOREMAN; can educate help and lay out templets; age 34, married, reliable. "Sheet Steel," 1 Church street, Detroit, Mich. Feb. 15

By first-class PLUMBER; all around mechanic. P. J. Kelly, 132 Gold street, Brooklyn, N. Y. Feb. 15

As CUTTER and FOREMAN in a galvanized iron cornice shop by a man thoroughly competent to handle every department of the business; 19 years' experience as a foreman. W. B. Rising, 1015 Spring street, Shreveport, La. Feb. 15

First-class PLUMBER wishes work in city or country; wages moderate. W. Kelly, 307 East Sixtieth street, New York. Feb. 15

STOVE and HEATER SALESMAN or position as salesman with a large stove and heater business, store or foundry, by a practical man; also practical experience on bidding and setting up of all kinds of heater work, a position to travel or position in store, foundry or office; fully able to bid on all kinds of stove and heater work. "Stove Salesman," care *The Metal Worker*, New York. Feb. 15

As FOREMAN in the tin and sheet iron department of a foundry making ranges and warm air furnaces; am thoroughly familiar with all work connected therewith and also understand indirect steam heating and ventilating; can furnish best of reference, having had 24 years' experience. "John G.," care of Frank H. Wilson, 3829 Germantown avenue, Philadelphia, Pa. Feb. 15

Young man, 24 years of age, PLUMBER and GAS FITTER, with some knowledge of tin roofing and spouting; temperate and reliable; first-class references; can go any place. F. Penpron, Box 306, Bridgewater, Mass. Feb. 15

PLUMBER and TINSMITH wants position, city or country. "Doellner," 2102 Eighth avenue, New York. Feb. 15

By young man as PATTERN DRAFTSMAN and CORNICE CUTTER, experienced in all kinds of cornice, skylight and sheet iron work; can furnish good reference; would like position in South or West. E. M. Williams, 514 Quincy street, Cleveland, Ohio. Feb. 15

As MASTER MECHANIC or SUPERINTENDENT of factory; sheet metal goods, cans, sheet iron, stoves, stove pipes, elbows, pieced and stamped ware. "Superintendent," care *The Metal Worker*, 1205 Chemical Building, St. Louis, Mo. Feb. 8

By a young man experienced in plumbing, steam and gas fitting, roofing and spouting. T. P. Kelly, 22 Almira street, Bloomfield, N. J. Feb. 8

By a young married man with three years' experience at the tinners' trade; would like a chance to finish the trade in Indiana or Ohio; can do slate roofing; am strictly temperate; will work reasonable for a steady job; state wages. Hawk Shaw, 520 Penn street, Muncie, Ind. Feb. 8

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Young man, PLUMBER and GAS FITTER, 24 years of age; temperate and reliable; single; some knowledge of tin roofing and spouting; can go anywhere. F. R. Pentlan, 220 School street, Taunton, Mass. Feb. 8

By STEAM and HOT WATER FITTER; can do plumbing, gas fitting and pump work; married; strictly sober; salary reasonable; can furnish reference from last employer; would prefer employment in New York or an adjoining State. "R. S. F.," care *The Metal Worker*, New York. Feb. 8

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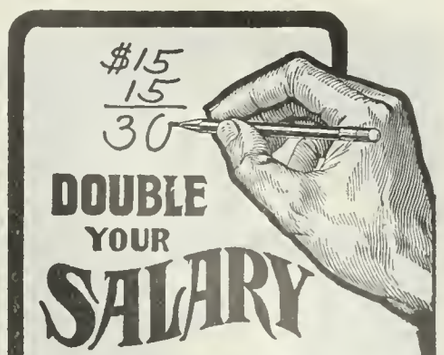
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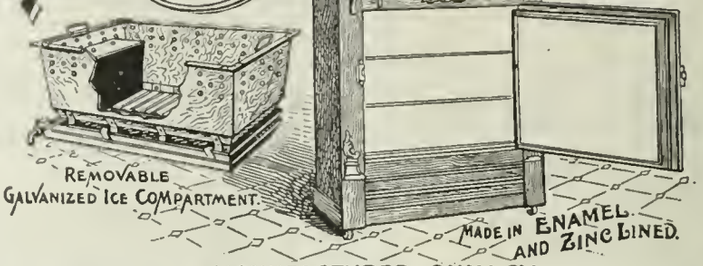
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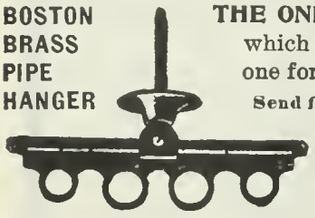


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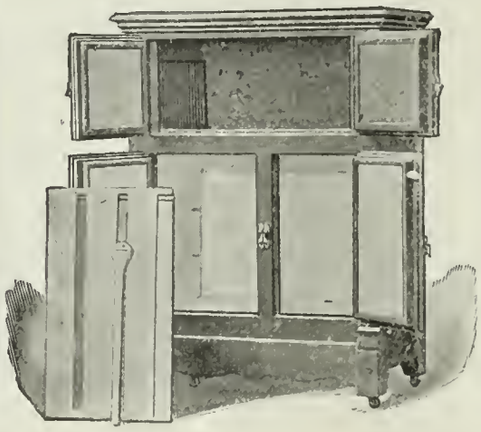
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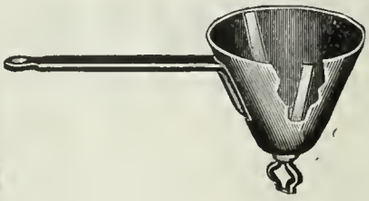
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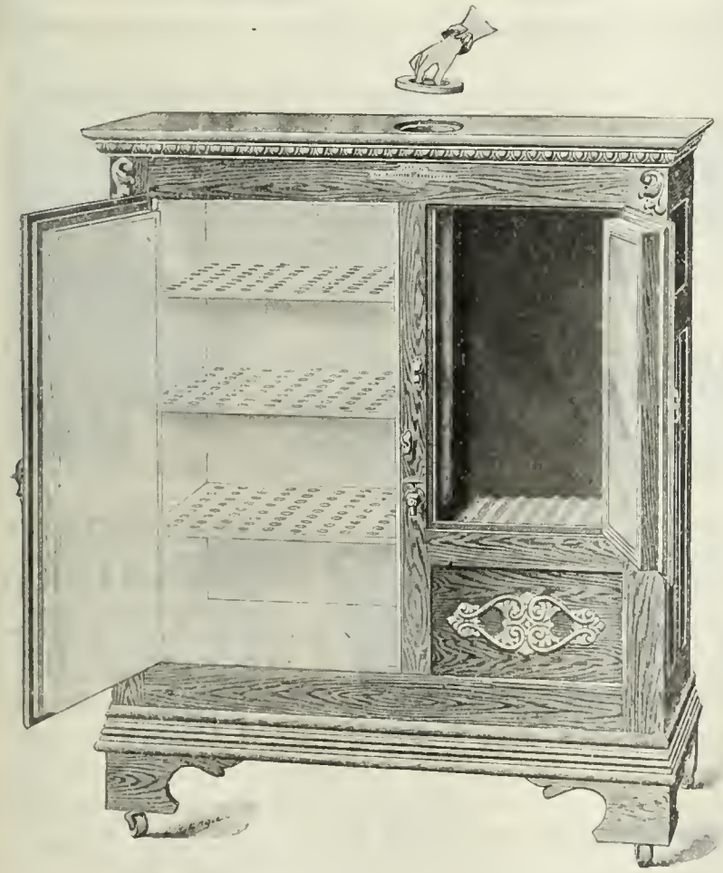
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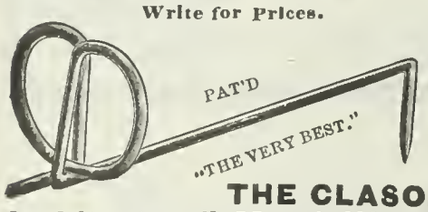
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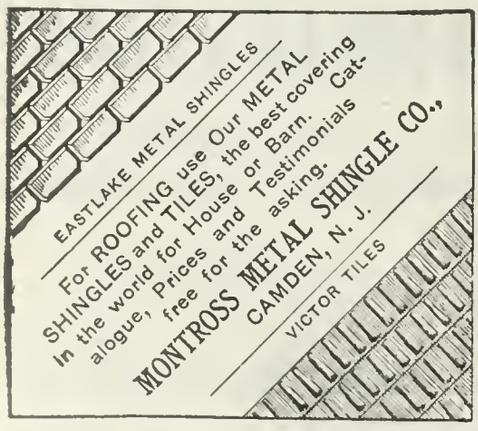
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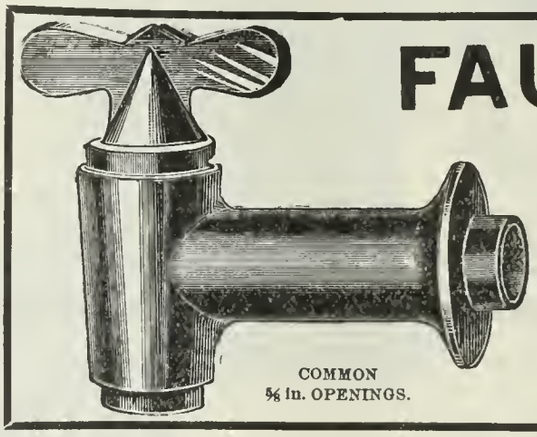


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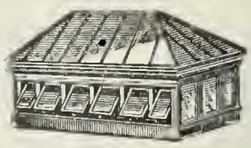
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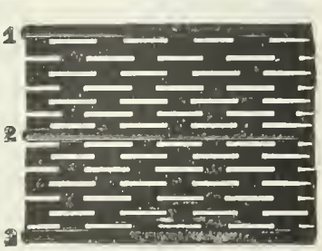
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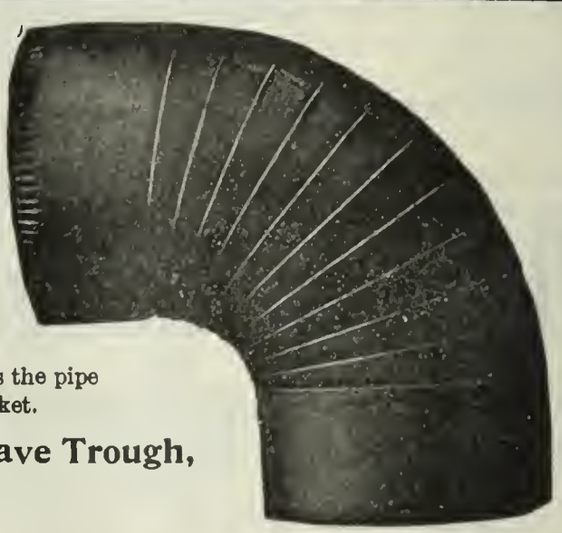
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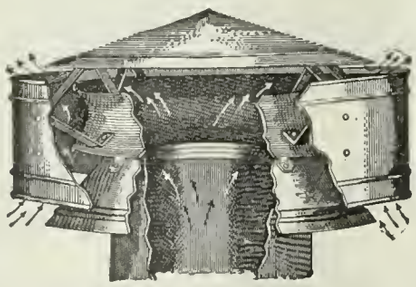
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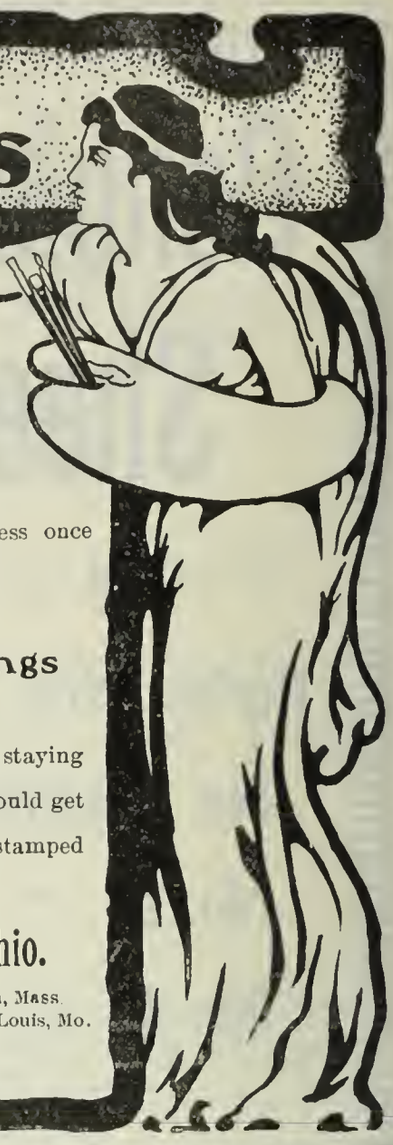
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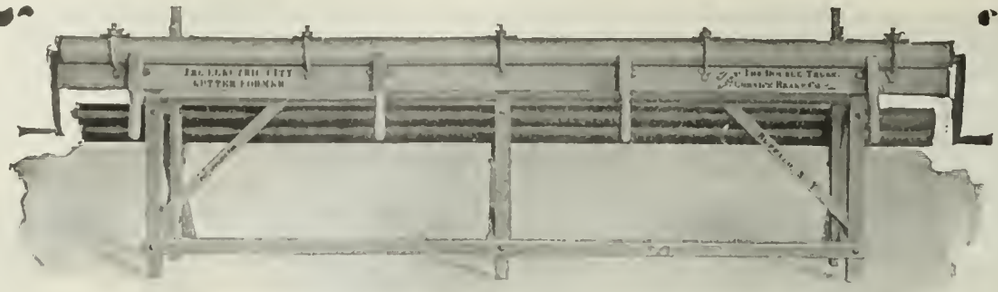
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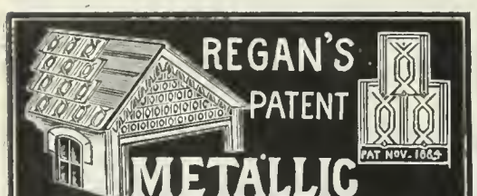
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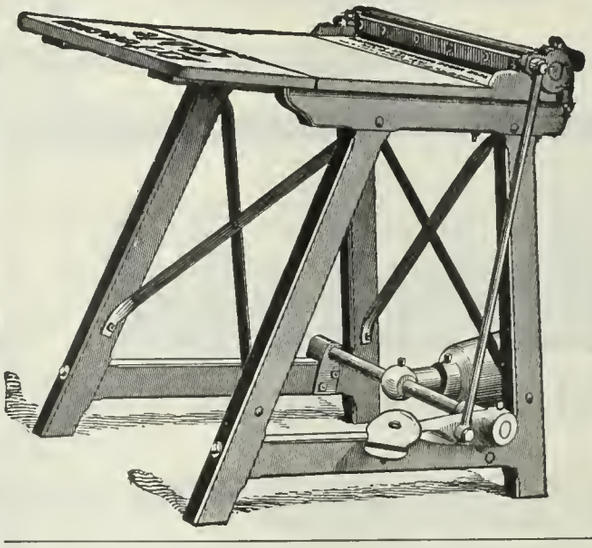
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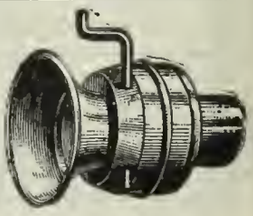
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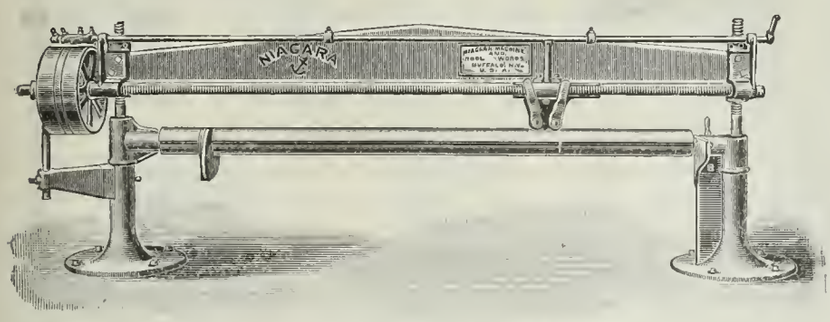
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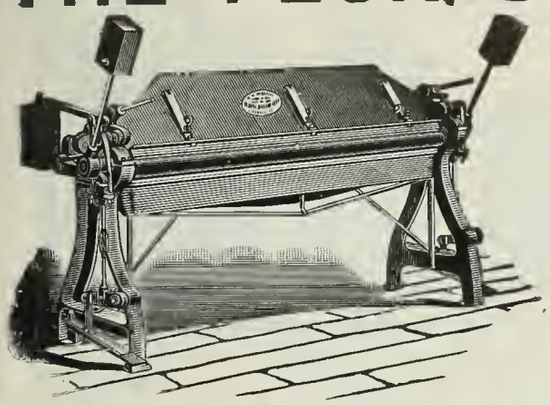
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THE PECK, STOW & WILCOX CO.,

New York,
—AND—
Cleveland, Ohio.



HARE'S FOUR LEAF CORNICE BRAKE.

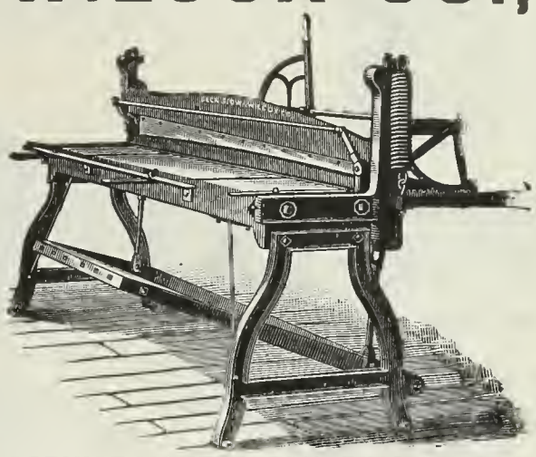
Hundreds sold and never a complaint. Works easily and rapidly. The universal verdict is, IT IS THE BEST IN THE WORLD.

96 inches long.

Tinsmiths' Tools of the Highest Grade.

Our *Improved Eureka Cornice Brake.* Will bend No. 20 iron.

96 inches long.

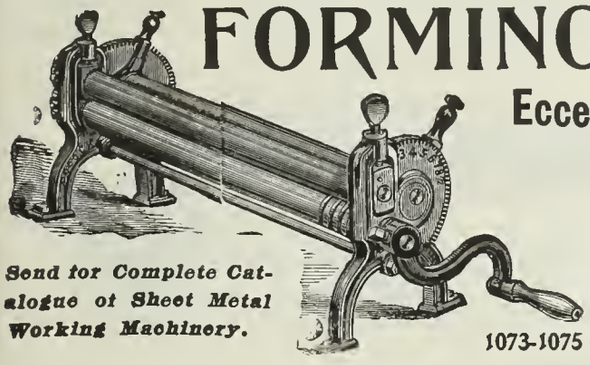


CORNICE MAKERS' SQUARING SHEARS. With Lever Arc, Automatic Gauge. Will cut No. 22 iron

97 inches long.

FORMING ROLLS

Eccentric Adjustment.



The advantage in using this machine is the quick adjustment of the back roll by means of graduated eccentrics.

Send for Complete Catalogue of Sheet Metal Working Machinery.

OLIVER POCOCK,

1073-1075 Clark St., Cincinnati, O., U. S. A.

20th Century Groover

for Hand Power. We also make them for Belt Power.



20th CENTURY GROOVER, Handiest out.

Operated from one position. Automatic knock-out and *Quick Return*. Grooves 22 gauge.

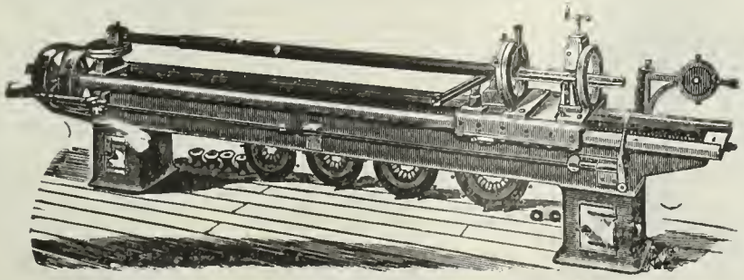
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W. A. WHEELER, Indianapolis, Ind.

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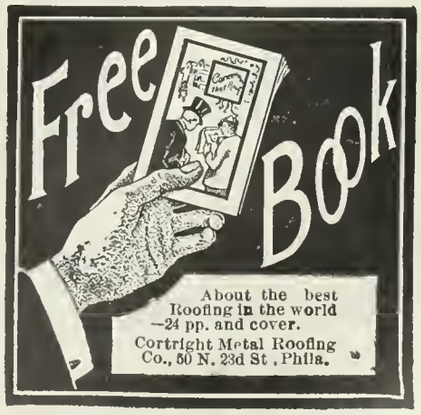
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Latest Improved 10-foot Plain Round, Round Corrugated and Square Corrugated Conductor Pipe Machine.

IT WILL PAY YOU TO GET OUR PRICES ON ABOVE MACHINERY







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MAIN OFFICE: 16 ADAMS ST., BROOKLYN, N. Y.

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Designers and Builders of Presses, Dies, Shears, Slitters, Double Seamers, Crimpers, etc., etc., for working all kinds of Sheet Metals.

A few of the many articles for which we make the complete machinery for producing are shown in the accompanying cuts.

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ELBOW PATTERNS

Developed on heavy detail paper, giving full size patterns for **Two, Three** and **Four** piece Elbows, from

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ONE DOLLAR.

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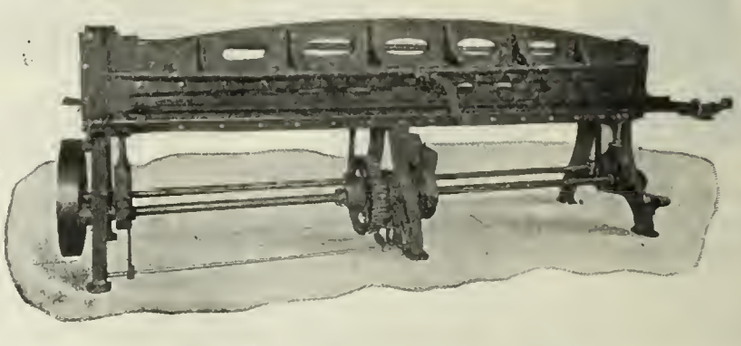
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BRAKES. (All Sizes.)

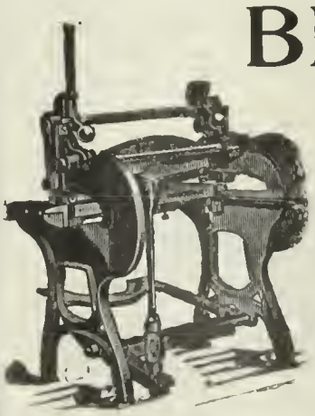
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Punches, Presses, Sheet Steel Lath Machines, Drop Presses, Draw Benches, and SPECIAL MACHINERY of all descriptions.



10 ft. Power Shear for No. 16 Soft Steel.

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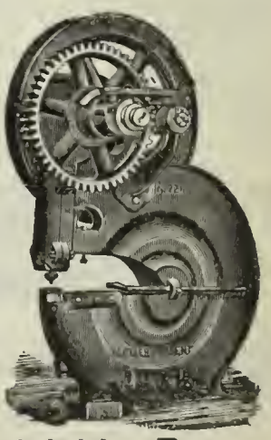


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SHEET METAL WORKING MACHINERY of every description.

Send for illustrated descriptive circulars and prices.



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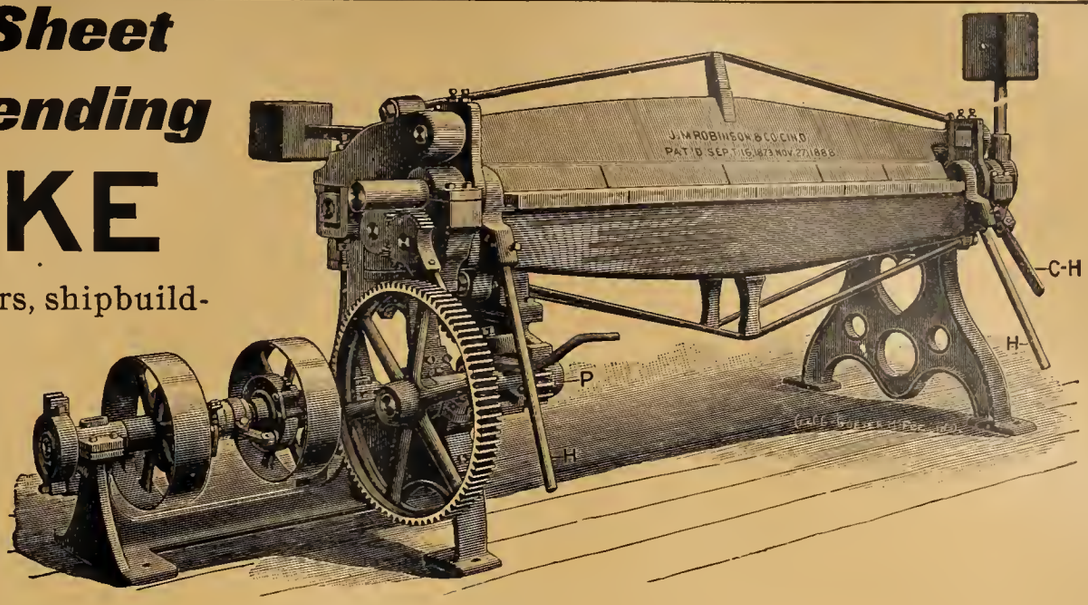
— HE KNEW.—"Pat, do you know what is the greatest barrier to the habit of drinking?"

"Oi do, sor."

"Oh, you do, eh? Well, what is it?"

"An impty bottle, sure."—*Richmond Dispatch.*

Heavy Sheet Metal Bending BRAKE



For range makers, shipbuilders, navy yards, and wherever heavy sheets are to be worked or formed. Made in 6 and 8 foot lengths, to bend No. 10 gauge or lighter.

THE J. M. ROBINSON MFG. CO.,

225-229 W. Second St., - - - - - CINCINNATI, O.

COMBINED Crimper and Corrugator.

Outfits for Iron Roofing Establishments a Specialty.

GEO. C. KEENE & CO.,
Cincinnati, Ohio.
Makers of the **KEENE CORNICE BRAKE.**



HERCULES SHEARS



make the cutting of sheet metal of heavy gauges an easy task for the mechanic and a profitable operation for the employer. With them a man can cut No. 12 steel with one hand on the lever, leaving the other hand free to guide the stock while cutting elbows, ties and circles, as small as 8 inch radius; this is done without burring or buckling either piece, thus avoiding hammering and straightening, which add to the cost of the product. They split sheets of any width or length up to No. 12 gauge, cut wire or bar-steel ⅛ inch thick, cut off and mitre angle iron ⅛ inch thick, and do it perfectly.

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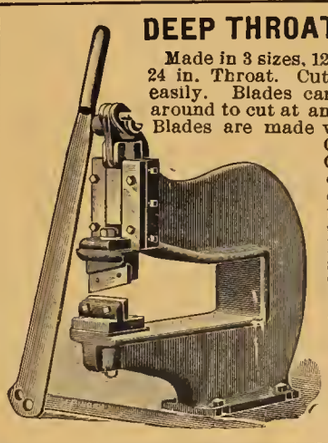
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CHAS. McSHERRY,
PITTSBURG, PA.
Designer and Builder of Labor Saving Metal Working Machinery and Tools.

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WESTERN AGENTS:
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TINNERS' TOOLS, MACHINES, and SUPPLIES Plumbers' Tools, Tinners' Hdwe., Soldering Flux Salts, Coppers, Rosin, Roofing Cement, Rivets, Bolts, Screws, Slaters' Tools, Second-hand Machinery and **SKYLIGHT GEARING.**
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DEEP THROAT SHEARS



Made in 3 sizes, 12 in., 18 in. and 24 in. Throat. Cuts No. 14 Iron easily. Blades can be swiveled around to cut at any angle. The Blades are made with a Double Cutting edge. Can be turned over when dull. For cutting out Irregular Shapes or Holes in large sheets, is a Good Machine

Send for prices

R.M. Clough,
TOLLAND, CONN.

PHILADELPHIA MACHINE TOOL CO.,
445 North Darien St., Phila., Pa.
TESTING MACHINES and *SOLE AGENTS* for HENNING TESTING APPARATUS.
PRESSES and SHEARS, CORNICE PRESSES CURVED MOULDING MACHINES, etc.

—CHURCH: "Have you a cozy corner in your house?"

Gotham: "O, yes; my wife has arranged two of them."

"You must enjoy them after a hard day's work."

"Enjoy nothing! The cat has one and my wife's dog occupies the other!"—*Yonkers Statesman.*

A FEARSOME SIGHT.

I saw a sight that filled with awe
My soul and made me quiver.
'Twas wondrous strange. I swear I saw
A shad roe up the river!

—*Exchange.*

—UNSAFE COMBINATION.—"This is our latest novelty," said the manufacturer, proudly. "Good work, isn't it?"

"Not bad," replied the visitor, "but you can't hold a candle to the goods we make."

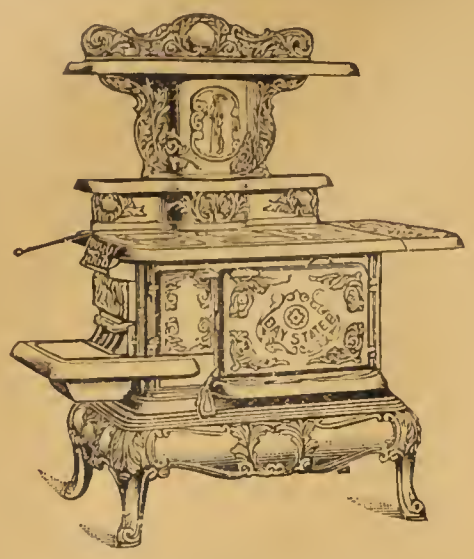
"Oh! are you in this line, too?"

"No. We make gunpowder."—*Philadelphia Press.*

—IT WAS EMERALD.—"What kind of oil, Pat, do you suppose they use to produce that color?" asked the citizen, as a freight train went by showing a green lantern.

"Shure, I should say some of the Imerald Isle, sir."—*Yonkers Statesman.*

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Will be the leader in **Range Society** the coming season.

It is artistic, thoroughly modern and right up to the minute in improvements of merit.

BARSTOW STOVE COMPANY,

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NEW YORK, Beekman and Water Sts.

ESTABLISHED 1810.

N. & G. Taylor Co.,

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TIN PLATE,

Black Plate, Plate Iron and Steel Sheets,

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ANNOUNCE THEIR

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Lighted by Frink Reflectors.

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American R. G., cleaned, of uniform black color.
Dealers in all kinds of Iron and Steel Scrap.

BRUCE & COOK

TINNERS' TOOLS and MACHINES

TINNERS' SUPPLIES

186, 188 & 190 Water Street, a
248 & 250 Pearl Street,
NEW YORK.



Ideal Sap Spou

Are made open or closed, and a full line of other Maple Sugar goods. Send for dealers' price list.

CHARLES MILLAR & SON CO., Utica, N.

HUB RANGES.



HUB RANGES sell quickly because they contain so many exclusive selling features, so sensible and self evident.

HUB RANGES are used and endorsed by all the leading Cooking Schools in New England and New York.

SMITH & ANTHONY CO., - Boston.

Send for Catalogue of Hub Water and Steam Heaters.

The Man Who Sells

Glenwoods knows nothing of the trials and tribulations of the dealer who sells goods that are shoddy. Glenwood Ranges and Heaters are **made right, fitted right** and **shipped right**; and that means its easy to reckon profits. If you want to do a clean, satisfactory, profitable business — sell

GLENWOODS.

Write the Weir Stove Co., Taunton, Mass.

SOLDER

Our Various Brands:

ADMIRAL, FORT PITT, FREEHOLD,

Are made from strictly New Metals and the Proportions Guaranteed.

McCLURE & CO.,

Manufacturers of Tin Plate,

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The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. LVII. NUMBER 8. NEW YORK AND CHICAGO, FEBRUARY 22, 1902. ONE DOLLAR A YEAR. SINGLE COPIES 5 CENTS.

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WALWORTH HEAVY PIPE VISE.



A first-class Tool for General Machine Work. Takes to 6-inch.

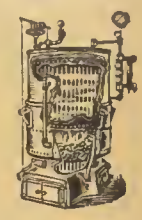
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The Gorton Side Feed Boilers

FOR STEAM AND HOT WATER HEATING.
INVESTIGATE FOR YOURSELF.
Send for Catalogue and Prices.

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Heating Specialties. American Steam Gauge & Valve Mfg. Co., Bismark St., Boston, Mass., U. S. A.

"Enclosed please find my check for $128 in payment of your bill. I wish to say that we have found the furnace in every way satisfactory, and am entirely pleased with it."

That's the kind of a letter that delights the heart of a dealer, and it is the kind you'll have no difficulty in getting if you install the Paragon Furnace.

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POLLO BEST BLOOM GALVANIZED IRON.

Bend it sharp, to see if it aks, or cracks, or weakens.
Drive nails through it.
Hammer it.
Try it according to what you nt it for.
Every sheet guaranteed to ir any test whatever. Re- n to your jobber at our en e if defective.

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So popular among the dealers? Because it is a lively seller and brings good profit. It stays sold and nobody kicks at it except the coal man.

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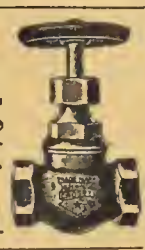
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Write for prices to John Sommer's Son, 355-365 Central Ave., Newark, N. J.



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GLOBE and ANGLE VALVES, IRON and BRASS.
All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.
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The Follansbee Pure Iron O d Style Roofing Tin is meeting with great success, as it is genuine Charcoal Iron Base, and the best made.

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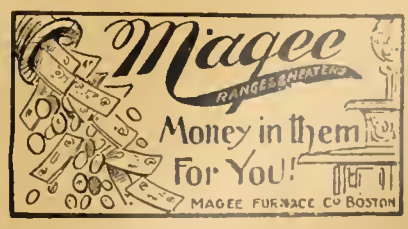
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Jenkins Bros.' Valves

are manufactured of the best steam metal, and are fully guaranteed. Why experiment with cheap valves? If you want the *BEST* ask your dealer for valves manufactured by Jenkins Brothers. Remember all genuine are stamped with Trade Mark like cut.

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Every stove dealer has a large and important asset in the customer who comes back satisfied

Some of those customers buy ranges.
You can always be sure that they have bought the best and most satisfactory range if you have sold them a

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You depend upon them for other trade.
The range you sell them should be a good advertisement.
If it is not you shut yourself out from business that ought to be yours.
You cannot talk the advantages of the Round Oak ranges until you are thoroughly familiar with them. It is our business and our pleasure to make you familiar. Write us.

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MAKERS OF GOOD GOODS ONLY

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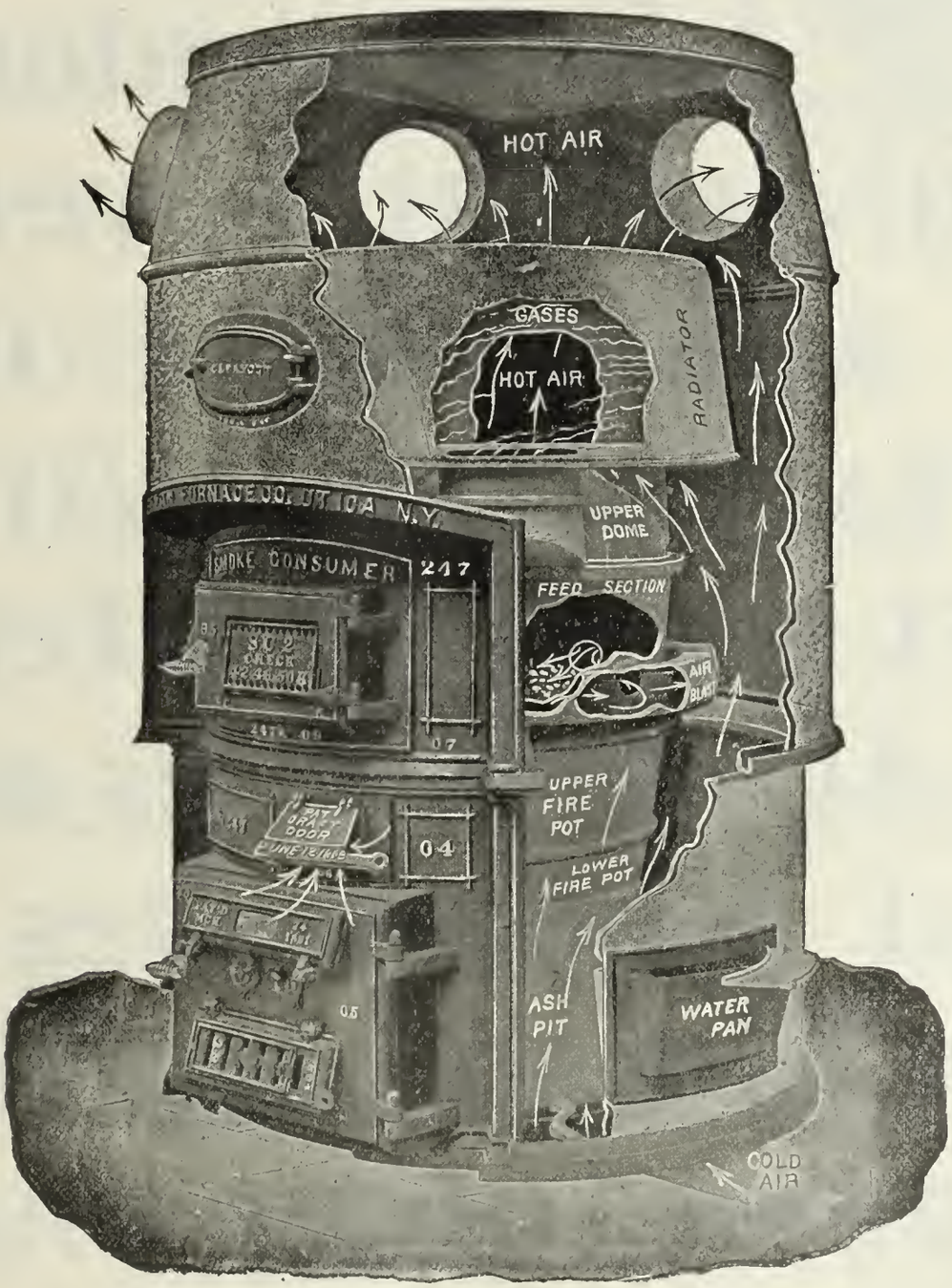
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EASIER, TOO, TO CALL A FURNACE A "SMOKE CONSUMER" THAN TO MAKE IT ONE.

THIS FURNACE DOES BURN THE SMOKE,

KERNAN SMOKE CONSUMER.

200th Series.



All Cast Iron, Very Efficient and Durable.

IT IS A FUEL SAVER, EVERY INCH OF IT.

Moderate in Price, Too.

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THE LARGEST MAKERS OF HEATERS IN THE WORLD.

FIFTEEN HUNDRE

YOUR heart is y
independent c
beats about seventy=
or at the rate of 1,
forty years! Within
rest has amounted to

Acorn Stoves are q
beat other stoves in
fine Finish. Hardwar
in most towns. An Ac



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Eastern Foundries,

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Pacific Coast Distributers: THE HARRY UNNA COMPANY

D MILLION BEATS

ur best friend;
your will it
wo times per minute
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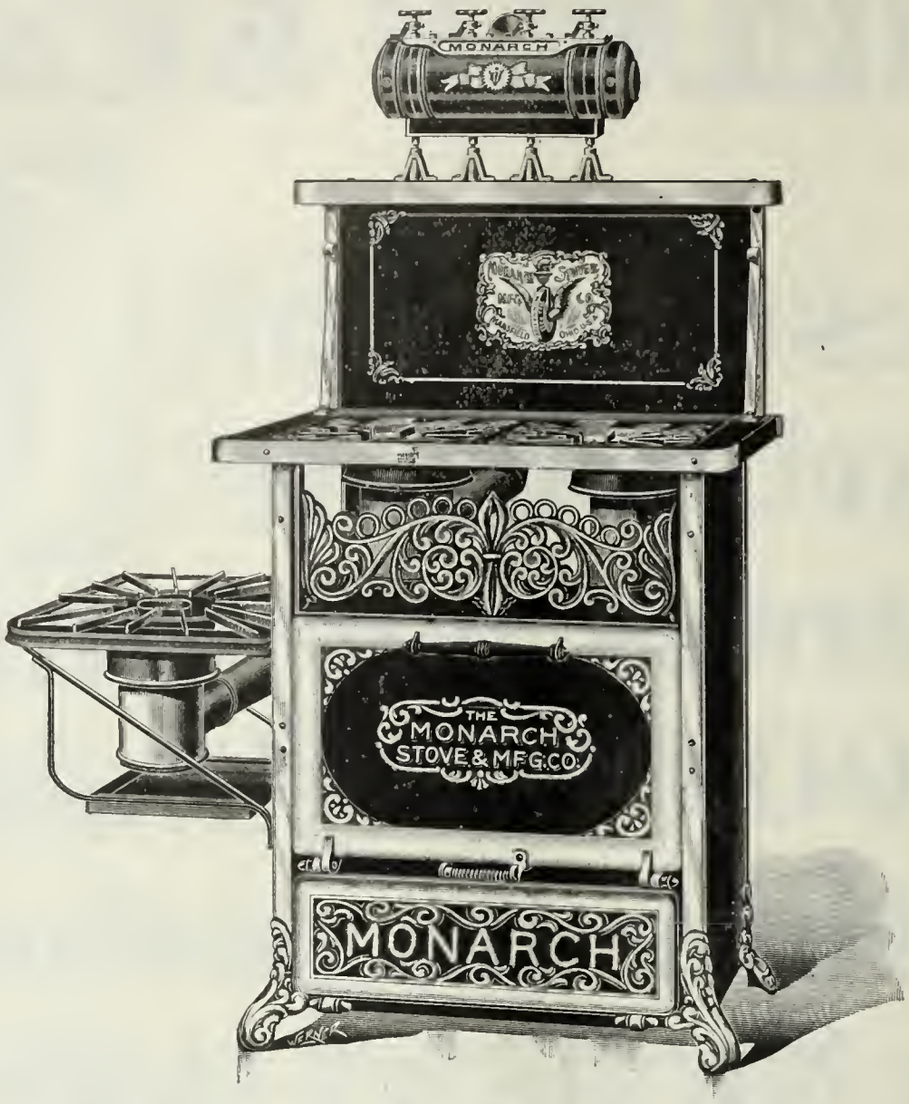
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Western Foundries,
AURORA, ILLS.

AN FRANCISCO, 113-115 Battery St., San Francisco, Cal.





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MONARCH NEW METHOD

EVAPORATING GASOLENE STOVES

For 1902.

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The Three Distinct Features on "MONARCH" goods are—

FIRST—Striking Originality and Distinctiveness of Features.

SECOND—Highest Grade Workmanship.

THIRD—Attractive and Artistic Design and Finish.

ANY ONE OF THESE THREE POINTS WILL PRODUCE PROFITS

THE MONARCH STOVE & MFG. CO., Mansfield, O.

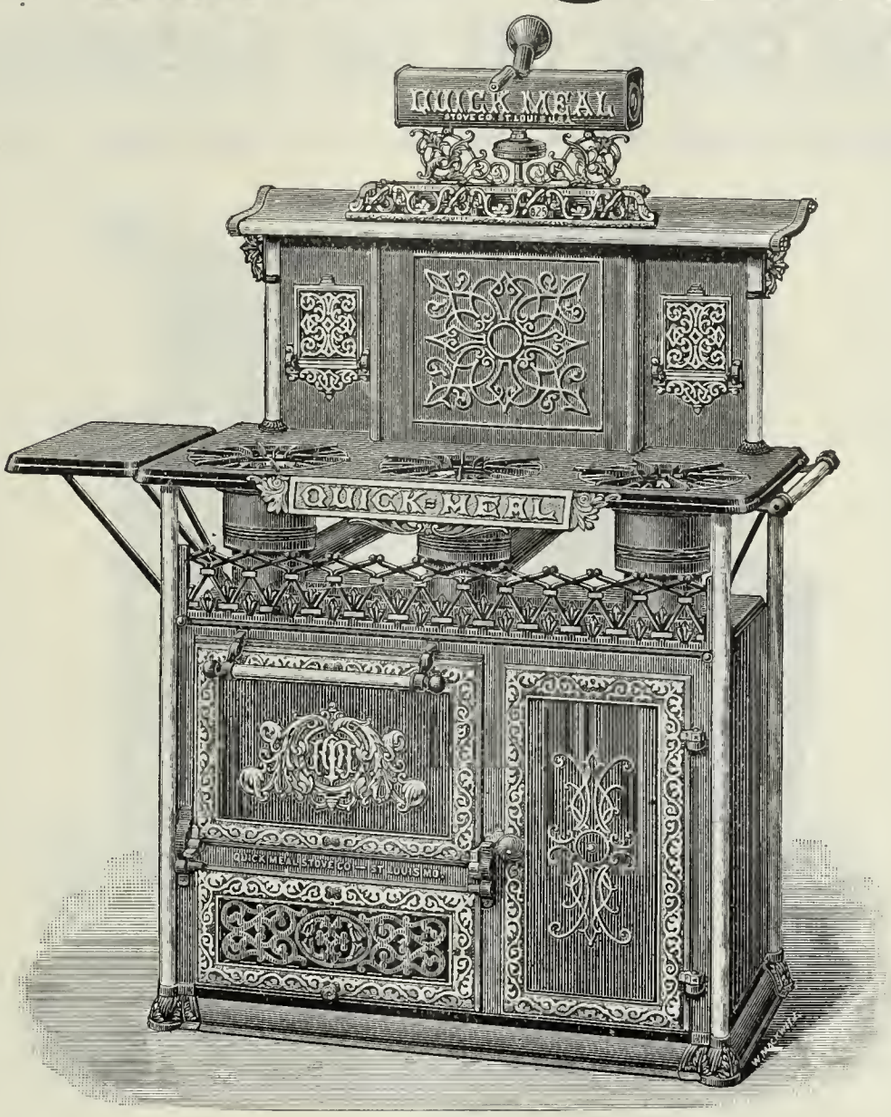
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Gasoline Stoves



"Quick Meal" Evaporating Stoves, with their German Silver valve points and their indestructible burner drums, have stood the severest of tests.

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YOU CAN DEPEND ON IT.

The Standard Wickless Blue Flame Oil Stove,

FOR COAL OIL OR GASOLINE.

The original and most successful Wickless Oil Stove.



That's what it is—The "Standard."—Standard in name, the Standard in quality, the Standard in perfect operation. Four years of continued success and it still leads. It's the Standard of excellence.

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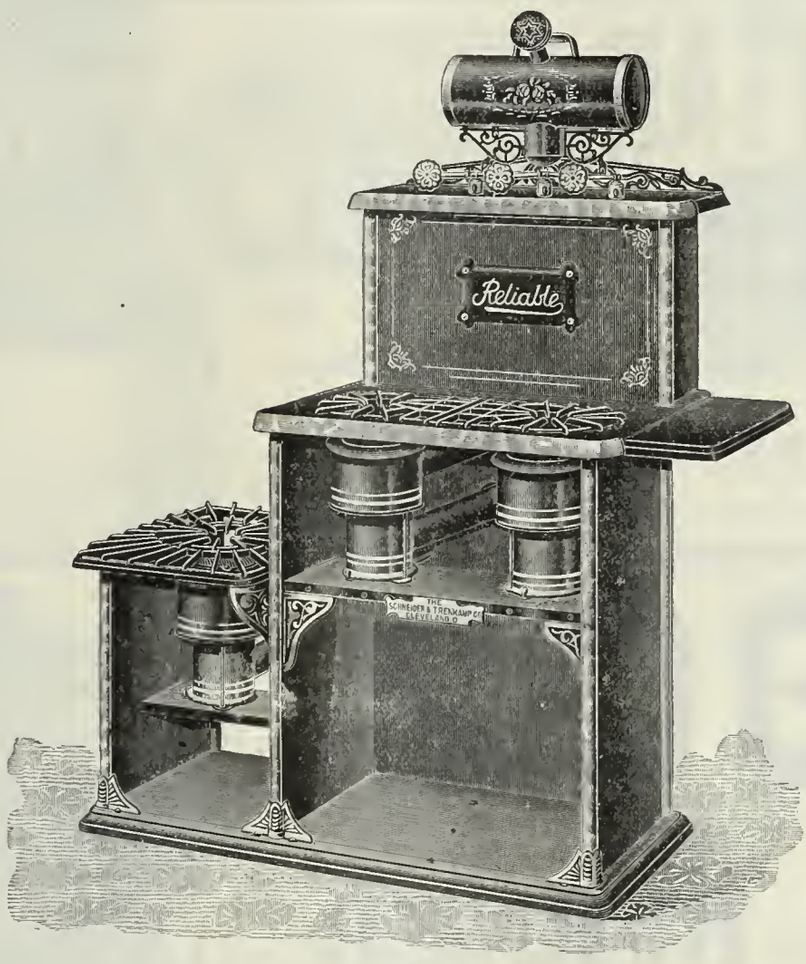
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Reliable Vapor Stoves and Ranges for 1902.

DEALERS who are seeking a strictly high grade line of Vapor Stoves and Ranges that are standard the country over cannot afford to overlook our line. "RELIABLE" Stoves have the NAME and FAME as being the best and most successful to handle.



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Our line for 1902 is larger and finer than ever. Send for our latest catalogue. It is yours for the asking.

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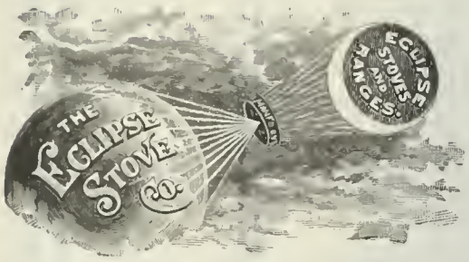
The Secret of It.

If your wife uses an ECLIPSE Stove or Range she can tell you the SECRET OF ECLIPSE SUCCESS.

ECLIPSE STOVES and RANGES ARE GOOD STOVES and RANGES

We want to show you what a complete and up-to-date line the "ECLIPSE" is.
Will you give us the opportunity by writing for our catalogue and circulars of new goods?





THE ECLIPSE STOVE CO.,
MANSFIELD, OHIO.

NOTICE:—If you haven't received our CALENDAR write for it.

REPOSITORIES:
OMAHA, NEB., (The Eclipse Stove Co.)
ST. ANTHONY PARK, MINN., W. H. Gruenhagen, Mgr.
DENVER, COLO., Kellogg & Stokes, Mgrs.
ATCHISON, KAS., The A. J. Harwi Hdw. Co., General Agents.

1902

THE TWIN BURNER

Line for the New Year is far and away ahead of anything yet shown in

Gasoline and Oil Stoves.

Our New WICKLESS BLUE FLAME OIL STOVE is the equal of any in the market. Perfectly Safe.



No. 480.
Our New No. 480 can be used for Gasoline or Coal Oil.

TWIN BURNER VAPOR STOVE CO.

206-210 South Seventeenth St.,
ST. LOUIS, MO.

JEWEL STOVES AND RANGES.



A Complete, Well Advertised Line; Low Prices and Good Workmanship

Please Write for Catalogue.

DETROIT STOVE WORKS.

Detroit - Chicago.



NATIONAL STOVES

THE ONLY SAFE GASOLINE STOVE MADE.

LORAIN, OHIO, CHICAGO, 104 Lake St.

"Insurance"

SALES AGENTS.

EUGENE MUNSELL & CO.,	New York
F. M. BORDEN & BRO.,	Philadelphia
PRESCOTT & CO.,	Boston, Mass.
BUTLER & JOHNSON,	Syracuse, N. Y.
PACIFIC STOVE CO.,	Los Angeles, Cal.
A. C. BARLER MFG. CO.,	Chicago, Ill.

HARPER & McINTIRE CO.

OTTUMWA, IOWA.

For IOWA, NEBRASKA. KANSAS, MISSOURI.

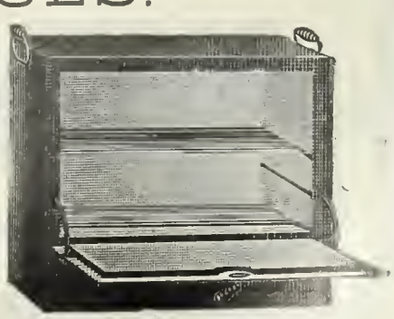
ACME LINE, 1902.

Asbestos Lined Ranges and Ovens, Cookers and Hot Plates.

FOR ALL GASES.



Catalog No. 35 on application.



H. ADLER CO.,

PITTSBURG, PA.

HENRY WATERMAN, - - 195 Lewis St., N. Y., Eastern Agent.

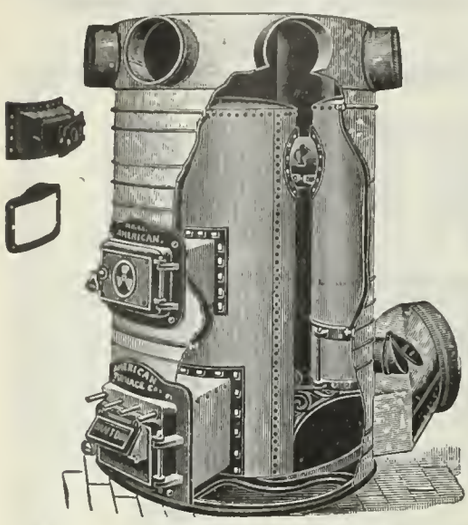
OUR CATALOGUE,

SHOWING

GAS RANGES
CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS

WILL BE FURNISHED FOR THE ASKING BY

Enterprise Stove Co., VINCENNES, IND.



Some Ripe Experience

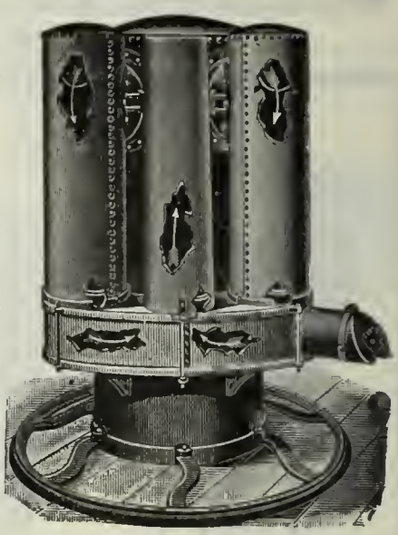
Has come to us through watching the doings of dealers throughout the United States.

We find that the dealer who sells cheap furnaces not only loses ground in the furnace business but also has a falling off in his other lines.

On the other hand, we can say that the man who sells a good furnace and charges enough to do a good job will, in a few years, be the leading furnace man in his town and at the same time build up his other business.

The *American Furnace* is made for the better class of trade; is durable, clean and economical in fuel.

The American Furnace Co.,
1911-13 PINE STREET, ST. LOUIS, MO.



Burn Hard or Soft Coal, or Coke. Large Doors.

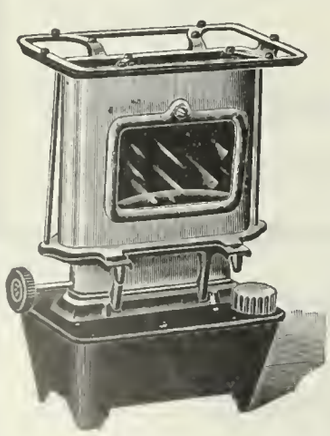
Large Radiators, easy to clean out.

Write for prices and secure the agency before the other fellow gets it.

THE TAYLOR & BOGGIS FOUNDRY CO.,

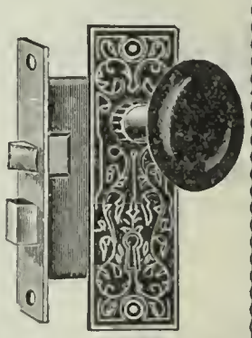
MANUFACTURERS OF

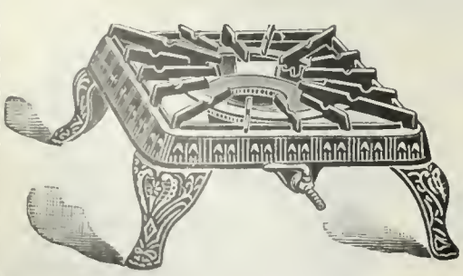
LIGHT GRAY IRON CASTINGS.

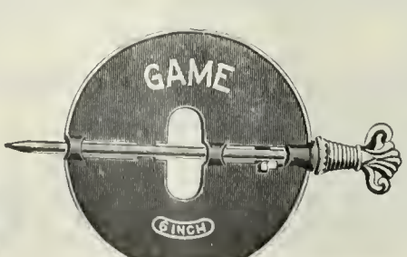


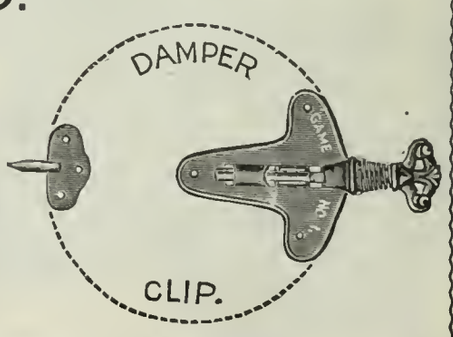
Builders' Hardware,
Dampers, Oil and Gas Stoves,
Furnace Lamps,
Molasses Gates,
Letter Boxes,
Hardware Specialties.

CLEVELAND, O.









THE H.B.SMITH CO.,
WESTFIELD, MASS., U.S.A.

Catalogue furnished only upon application to

Heating Contractors, Engineers and Architects

64 Pages. Size 9 x 12 Inches.

INDIRECT RADIATORS

(16 STYLES)

PACIFIC COAST AGENTS

HOLBROOK, MERRILL & STETSON,
SAN FRANCISCO, CAL.

EUROPEAN AGENTS

AUG. EGGERS,
BREMEN AND NEW YORK CITY.

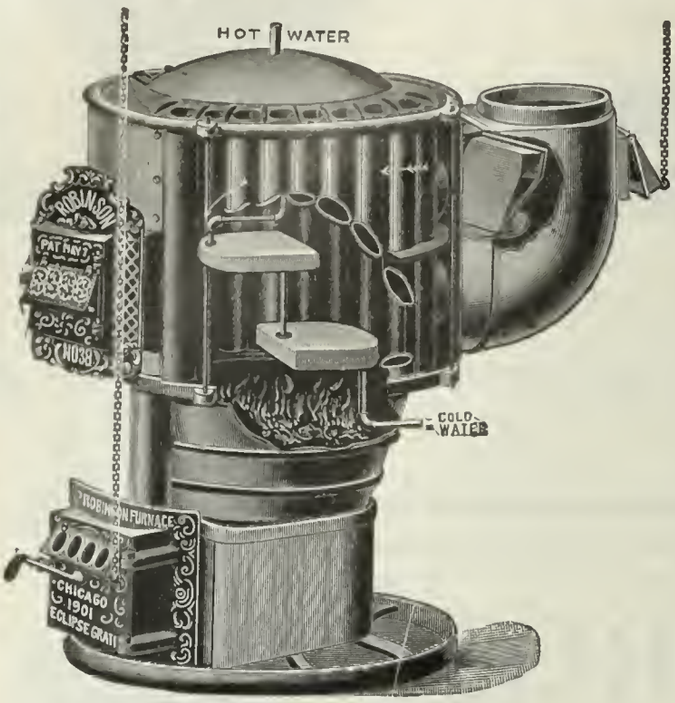
SALESROOMS:

THE H.B.SMITH CO.,

133 CENTRE STREET.,
NEW YORK.

510 ARCH STREET.,
PHILADELPHIA.

The Robinson Tubular Warm Air Furnaces



Robinson Tubular Furnace for Hard Coal.

are constructed to give the greatest amount of heat from the smallest amount of fuel. These furnaces contain many special features not found in other heaters. These features are original with us and are fully protected by letters patent.

Write for catalogue.



Double Doors on Robinson Tubular Furnace.

ROBINSON FURNACE CO., - Chicago, Ill.

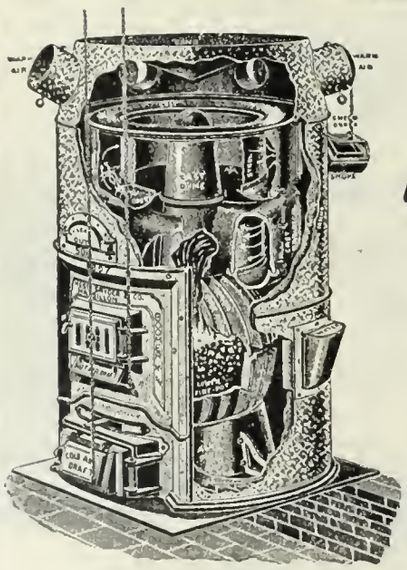
Boxlet Copyright, '98.

REGARDING

Boomer Furnaces.

OR

Boomer Steel Ranges

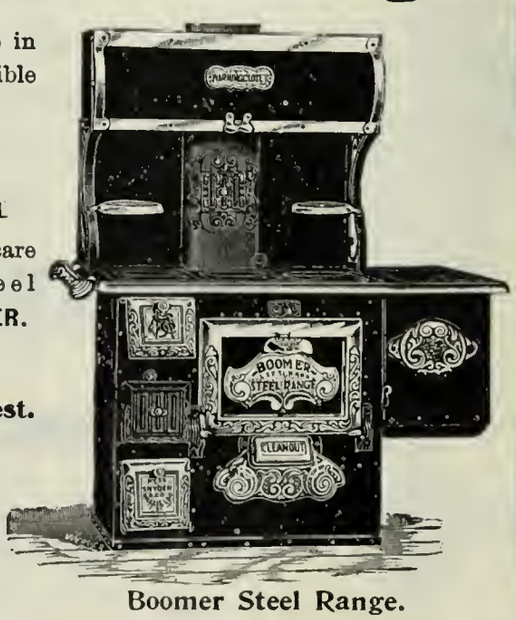


Boomer Furnace.

We want to state in strongest terms possible that if you want the

HEAVIEST,
MOST DURABLE,
MOST ECONOMICAL

and easiest to take care of Furnace or Steel Range, buy a **BOOMER.**



Boomer Steel Range.

Neither time nor money is spared to make them the Best.
Buy Boomers and save your coal bills.
We invite investigation.

THE HESS-SNYDER CO.,
Manufacturers, MASSILLON, O.

JEWEL
SMOKELESS
GENERATOR
STEEL RANGE

Made on the plan of the steel gas range brought out last year by Geo. M. Clark and Company.



Stood Every Test.

Thousands Were Sold.

Every Record Broken.

Each One Sold Others.

Less Costly than Cast Iron.

People who had no faith in Steel Ranges till ours was tried, are buying them by the carload. We predict the same success for the *GASOLENE* Range. Write for catalog.

A SAMPLE ON YOUR FLOOR IS SURE TO SELL OTHERS.

GEORGE M. CLARK AND COMPANY,

73 LAKE STREET, CHICAGO.

'Tis Never Too Late To Learn!



HERO ALL CAST.

If you do not KNOW
that we make

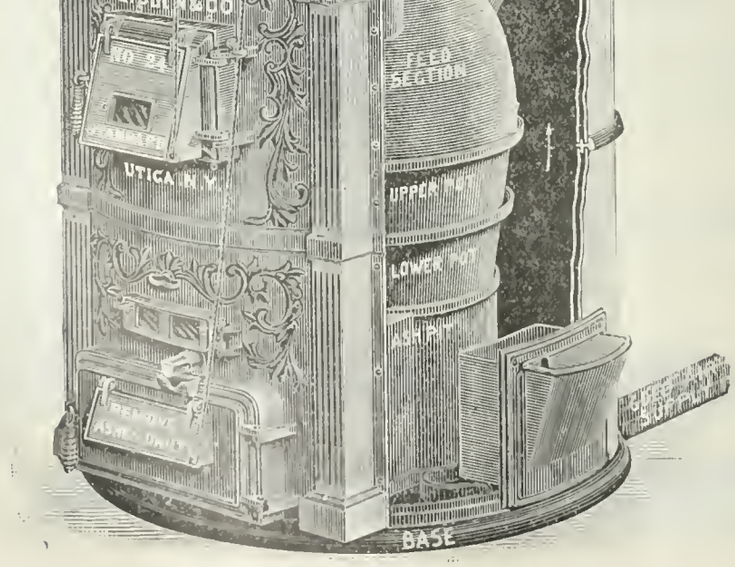
HARD COAL Furnaces,
SOFT COAL Furnaces,
ALL CAST Furnaces,
STEEL RADIATOR Furnaces,
HIGH GRADE Furnaces,
MEDIUM GRADE Furnaces,

NOW IS THE TIME TO LEARN ALL ABOUT THEM.

Write and give us an opportunity to try to interest you.

THE GRAFF FURNACE CO.

208 WATER STREET, NEW YORK.



WORK WELL DONE AT LITTL ECOST.

SOMETIMES

a furnace costs little but makes up the cheapness in the quantity of coal it consumes; sometimes a furnace costs a great deal and the extra cost is made up by the saving of the fuel; sometimes a furnace costs a moderate price and does the work well and saves fuel.

A FURNACE

of the latter class is shown herewith, and our catalogue shows it more thoroughly.

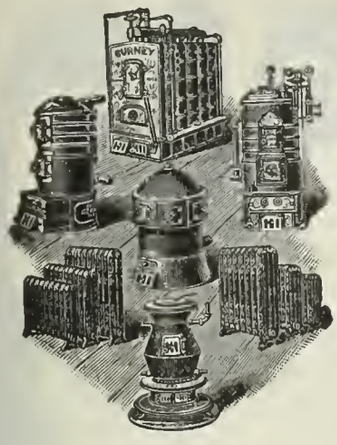
Here is the experience of one man with this style of furnace:

L. J. CLARK, Villas, Pa., says:

"I want to tell you how my furnace acted one winter. Down stairs I heat 3 rooms and pantry and hall, using a gasoline stove for cooking; up stairs, I heat 3 bedrooms, bathroom and hall, and also have one register in attic which was used occasionally, making in all 10 registers. I moved into the house on the 4th of November and had fire up to the 5th of May. I bought eight tons of soft coal at $1.80 per ton, total $14.40. I had about 1¼ tons left over. We had loads of hot water heated in furnace, so that fuel for gasoline stove only cost about $2.10. This looks rather small for expense, but nevertheless it is a fact."

GET OUR CATALOGUE AND PRICES.

GIBLIN & CO.,
UTICA, N. Y.



Even members of the same family are not always alike in virtue or ability, yet the

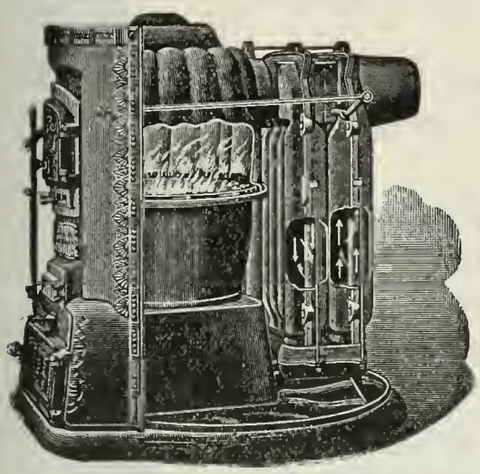
Gurney Heaters

Are of uniform excellence. In all of them the heating surfaces are so arranged as to produce a maximum of heat from a minimum amount of coal.

All are made from the best grades of iron, have the most efficient types of grates, and embody all the latest improvements. "Bright Idea," "Doric," and "400 Series" Steam and Hot Water Heaters are thus equipped. Sales of any of them will enhance your reputation. Would you become an agent? Let us hear from you.

GURNEY HEATER MFG. CO., 74 Franklin Street, Boston.
111 Fifth Ave., New York City.

Western Selling Agents, JAMES B. CLOW & SONS, 222-224 Lake St., Chicago, Ills.



Bengal Furnaces.

EASY TO SELL. SURE TO PLEASE.
LEADERS OF THEIR CLASS.

3,500 square feet of radiating surface—more than any other furnace their SIZE.

ALL CAST IRON.

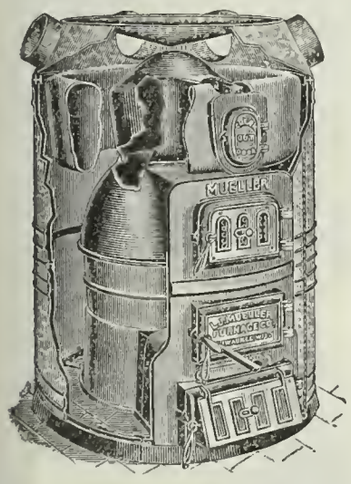
Secure a BENGAL AGENCY at once.

CATALOGUE ON APPLICATION

EASTERN SELLING AGENTS:
GURNEY & CO.,
Washington, Hanover and Elm Streets, Boston, Mass.

FLOYD, WELLS & CO., Royersford, Pa.

Return Flue Radiator. All Cast.



MUELLER

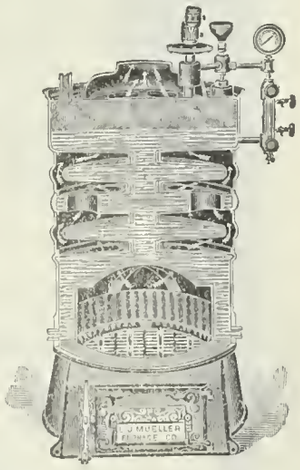
Furnaces and Boilers
BRING CUSTOMERS

To Dealers Handling This Line.

ALL STYLES FOR ALL KINDS OF FUEL.

Get Our Special Register Offer.

EVERYTHING in the HEATING LINE.



190 Reed St., L. J. MUELLER FURNACE CO., Milwaukee, Wis.

Refrigerators, Blue Flame Oil Stoves, Gasoline Stoves.

LARGEST JOBBERS in NEW ENGLAND.

Gas Ranges, Furnaces, Stoves, Ranges and Repairs.

HENRY N. CLARK CO., 56 and 58 Union Street, BOSTON, MASS.

If You Build a Bonfire

you will notice that a big share of the heat produced rises straight up into the air. Burning brands and live cinders, etc., take wings, also. Every atom of this flying matter contains valuable heat.

The ordinary furnace is a big improvement on the bonfire, but there is a similarity. Volumes of smoke and gas escape, which mean good heat wasted.

The Peck Williamson Underfeed Furnace stops all this. It compels the gases and smoke and combustion products of the coal to circulate up through a live bed of coals.

They are therefore consumed, practically every heat unit extracted, not wasted up the smoke flue.

You can't get around the fact that a furnace like that will save coal every minute it is running.

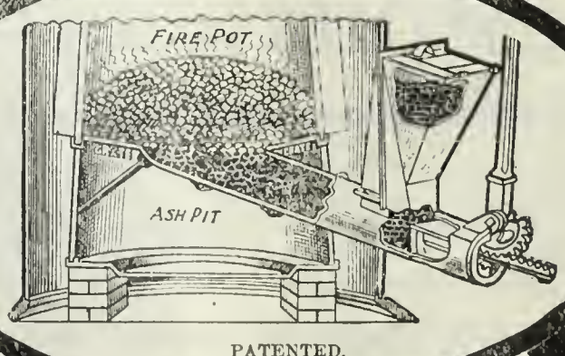
You can't deny that a furnace like that will get more good out of the coal.

You haven't a customer who can conjure up a solitary argument against the Peck-Williamson Underfeed Furnace.

We are anxious to prove to your satisfaction every claim we make. Our claim is remarkable. This furnace is remarkable. Send for our new booklet to-day.

The Peck=Williamson Company,

Cincinnati, = = = = ***Ohio.***



PATENTED.

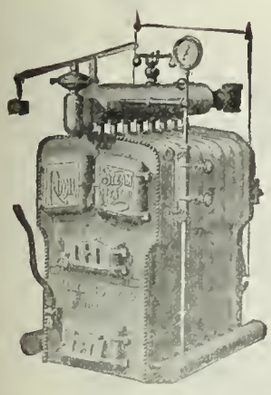
Royal Heaters.

HART & CROUSE CO.,

UTICA, N. Y.

The Leading Line of Heating Apparatus.

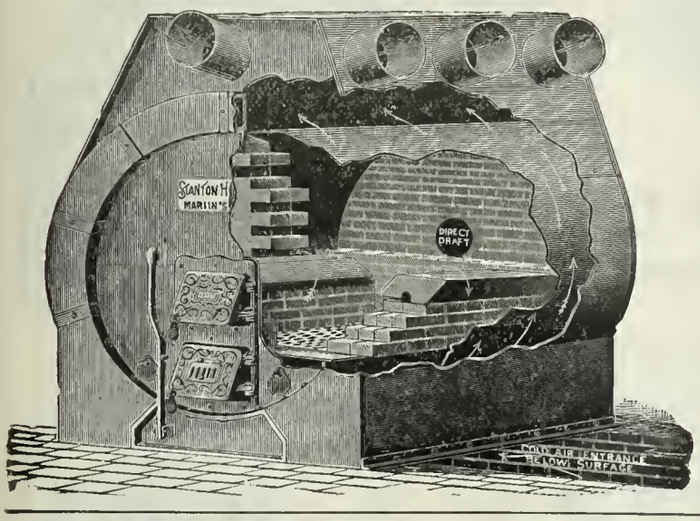
HOT WATER,
STEAM,
HOT AIR.



BRANCHES:
235 Water St., New York.
79 Lake St., Chicago.

The Stanton Seamless Heater,

PORTABLE CASED.



LOUISVILLE, KY., Apl. 5th, 1901.

THE STANTON HEATER CO.,
Martin's Ferry, Ohio.

Gentlemen:—Your favor of the 3d inst. is received asking our experience with the Stanton Heater which you put in for us during the fall of 1899. In reply we will say that it gives us pleasure to express our entire satisfaction with this Furnace. While we have had no severe weather this winter there have been several quite cold snaps, but our offices have been very comfortably heated, and our coal bill (Pittsburgh coal) has been quite moderate compared with other Heaters we have used.

The satisfaction the Heater has given us can be best expressed by saying that we have not heard the Furnace mentioned once this winter. You can see, therefore, that we have had absolutely no cause for complaint.

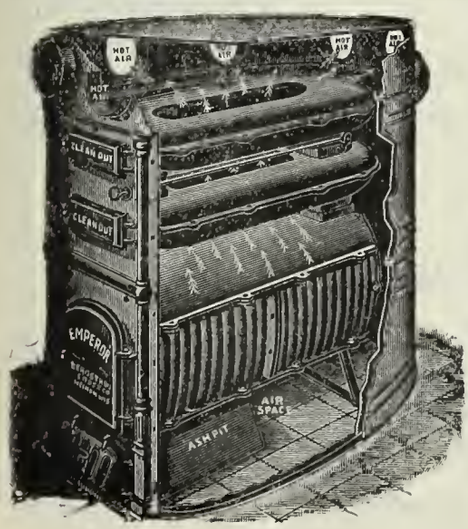
Yours very truly,
ROBINSON-HUGHES & CO.

SEND FOR CATALOGUE.

THE STANTON HEATER CO.,

Martin's Ferry, Ohio.

See our advertisement next week.



Emperor Furnaces

FOR WOOD.

Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces. . . .
Furnished for either Brick or Galvanized Iron Casing

SEND FOR CATALOGUE.

Bergstrom Bros Co.

NEENAH, WIS.

They regulate heat in residences, offices, stores, mfg. plants. Guaranteed.

The Howard Thermostat Co.

West Water Street, Oswego, N. Y.

No electricity or compressed air. Simple as a heavy spring motor can be.

Would like to send you their catalogue and give a few reasons why you should sell their Heat, Valve, Draft and Damper Regulators. This should be an interesting topic. We have the most simple thermostat made; also the most sensitive. Only three parts—a sensitive and powerful sensitive plate, a heavy spring motor made of brass, and common pulley connections. Just enough material to do the work satisfactorily, but not one atom too much. They do "straight work," without the aid of outside agencies. No other thermostat on the market can do more with all of its electricity and compressed air connections.

THEY SAVE THE COAL

WHICH IS WASTED BY THE WRONG OPERATION OF FURNACE OR BOILER DAMPERS.



The FORBES FURNACE.

You run no risk in putting in the

Forbes Furnace.

When properly installed we guarantee them in every case.

They are constructed entirely of cast iron.

No sheet iron drums.

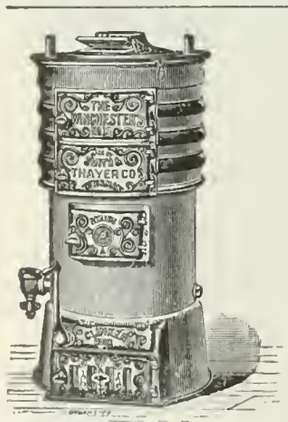
Our radiating tubes are ⅛ in. thick, and will wear for years.

Specially suited for low cellars.

SEND FOR CATALOGUE AND FULL PARTICULARS.

Tubular Heating & Ventilating Co.,

228 Quarry St., Philadelphia, Pa.



WINCHESTER

We are like the modest young girl who was told hy her aunt that it was a solemn thing to get married. "But it's a good deal more solemn not to be," was her reply. We dislike to harp forever on the merits of the "WINCHESTER" heater, but it would be far worse not to have the "WINCHESTER" to talk about. Smith & Thayer Company, Boston, Mass., 106 Beekman St., New York.

HEATER.



BRAND STOVE CO.

STOVES, RANGES and FURNACES.

SEND FOR CATALOG.

MILWAUKEE, WIS.

Gurney

HOT WATER GENERATORS
HOT AIR GENERATORS
STEAM GENERATORS
RANGES *and* STOVES
REFRIGERATORS
STEEL RANGES
GAS RANGES
FURNACES

GURNEY AND COMPANY

WASHINGTON, HANOVER AND ELM STREETS

BOSTON, - MASSACHUSETTS

STAMFORD FOUNDRY COMPANY

MAKERS OF

RANGES COOKING AND HEATING STOVES
HOT-AIR AND COMBINATION AIR AND
WATER FURNACES
LAUNDRY STOVES CONFECTIONERS' STOVES
CABOOSE RANGES ETC ETC

STAMFORD CONN

"TORRID HEATER."
FOR STEAM OR HOT WATER.



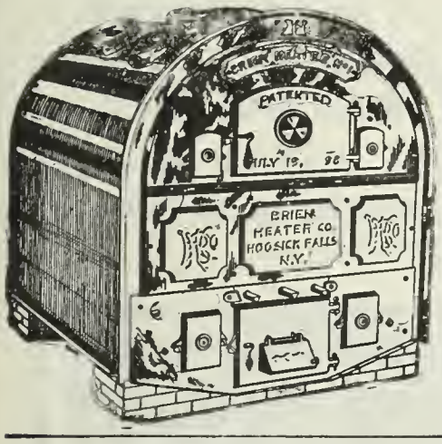
It is Practical in Design.
It is Safe, Being Tested to 200 Pounds.
It is Easy to Manage and Keep Clean.
It is Durable.
It is Sectional and Easily Handled.
It has No Packed Joints.
It is Self-Feed or Surface Burning.
It has the Torrid Patent Rocking and Dumping Grate.
It is Low in Price.

SEND FOR CATALOGUE.

MANUFACTURED BY

W. H. DRAKE, No. 36 Clinton St., NEWARK, N. J.

Factory: Hackettstown, N. J.



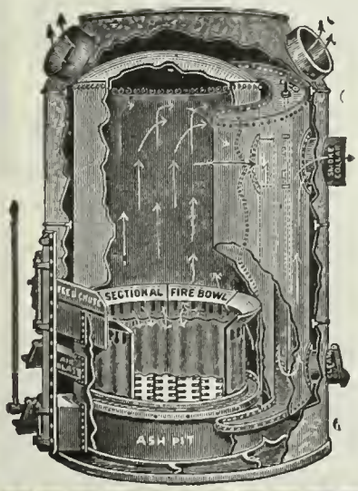
Brien Heater.

A perfect, all cast WOOD or COAL burner. There is no other Hot Air Furnace as low down as the "BRIEN."

Write for territory, catalog and prices.

BRIEN HEATER CO.,
HOOSICK FALLS, N. Y.

The Torrid Zone Furnace



is a trade winner because it has points of merit peculiar to itself that can be found in no other steel furnace. Our new catalogue is now ready to mail and a description of our Hot Air and Hot Water Combination Furnace can be seen in it. We furnish either the cast iron lining or the fire brick at the same price. Our Wood Furnace is called a powerful heater by those who use it.

CATALOGUE FREE.

Lennox Manufacturing Company,
Eighth Ave. and Frederick St.,
MARSHALLTOWN, IOWA.

HOT WATER AND HOT AIR



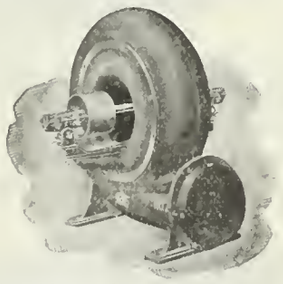
HEATING BY COMBINATION STOVES AND FURNACES.

Suitable for Large or Small Houses, Stores, Conservatories, Barber Shops, Hotels, etc., etc.

Heat Water Quickly.
Circulation is Positive.
No Joints Inside to Leak.

THE NATIONAL PIPE BENDING CO
160 RIVER ST., NEW HAVEN, CONN.

The "A B C" Volume Blowers and Exhausters.



Scientific in design. Construction and efficiency guaranteed.

American Blower Co.,
Detroit, Mich.
New York. Chicago. London.

We Protect Dealers

WHO HANDLE BURTON'S



FUEL ECONOMIZER.

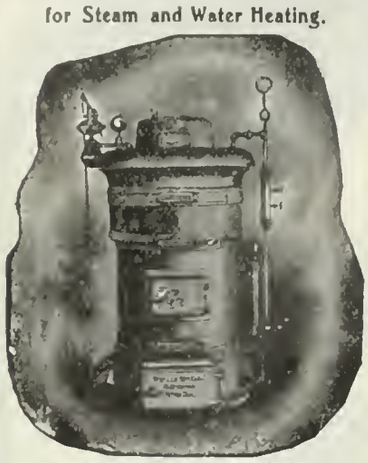
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BOILERS and RADIATORS

for Steam and Water Heating.



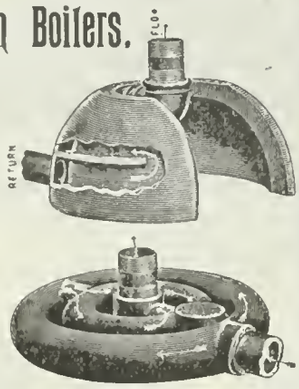
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LARGE HEATING CAPACITY.
ECONOMIC IN FUEL CONSUMPTION.

Endorsed by the foremost Architects and Heating Engineers.
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The Champion Hot Water Combination Boilers.



They Fit Any Furnace.

Base section when used without ring sections.

Ring Section.

These Boilers are made in three sizes diameter, and from 100 to 600 square feet radiation capacity.
Will heat those cold rooms, or an addition to the building. Will increase the capacity of any furnace. Are cheaper than coils and will do more work.
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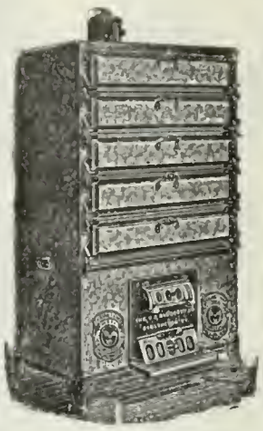
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The most economical Steam and Hot Water Boiler on the market. Write for Catalogue and Price List.

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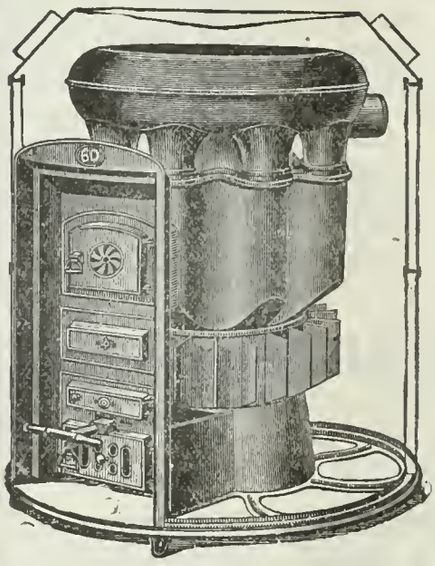


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HAVE BEEN COPIED
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An Absolutely Gas Tight Furnace Without Bolted Joints.

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Established 1847.



THE CANTON PERFECT BLAST.

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WARM AIR FURNACES

Heavy Castings, Tubular Radiator,
Large Secondary Radiator,
A Perfect Blast,
ALL INSIDE THE CASING.

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THE BEST GAS STOVE MADE.

Best Materials and Workmanship. Prices Low. Mail Orders Promptly Filled.

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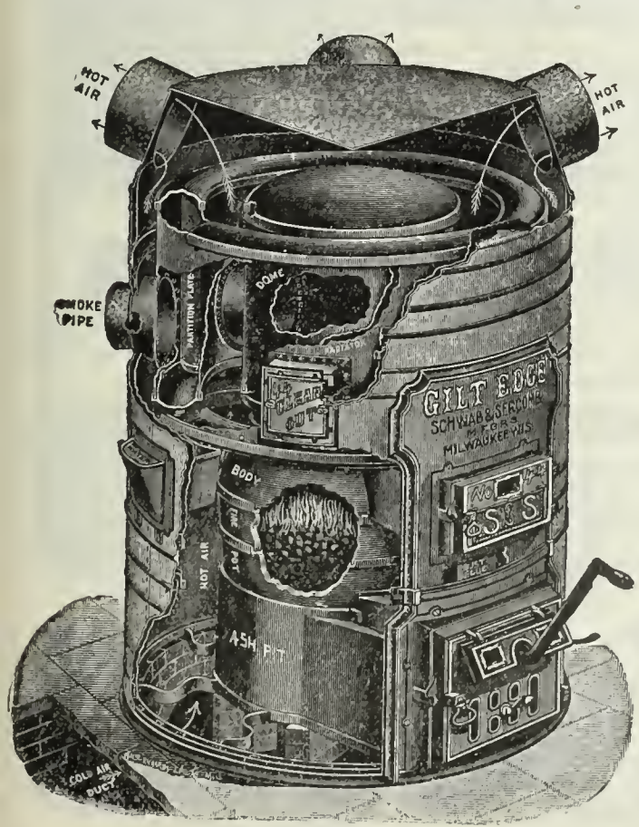
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DON'T

look any further if in search of boilers for steam heat or hot water. The list opposite contains the standards. Send for catalog and get acquainted with them.

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Gilt Edge Warm Air

AND

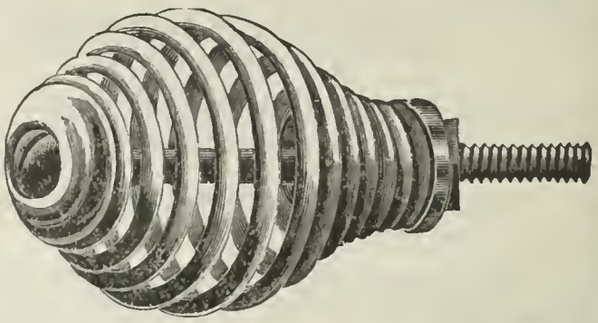
Combination Heaters

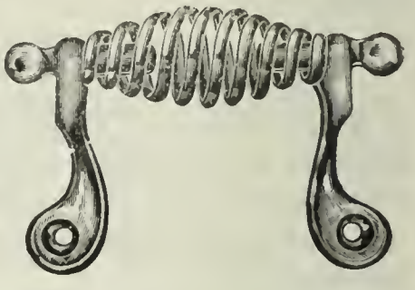
have merits that are all their own. They are made in a large variety of styles and sizes, each adapted especially to a certain class of fuel. We are manufacturers of a complete line of Warm Air Registers, Safety Pipe and Tin Galvanized Iron Furnace Fittings.

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ESTABLISHED 1880.

All The Latest Novelties in Stove Trimmings.

ALWAYS COLD.

If you want your stoves up-to-date you must use
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Who sells cheap goods at cheap prices cannot expect to enjoy his share of the general prosperity of the country.

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"O.H." ONE PIECE STOVE PIPE Elbows

Perfectly round and true to size. With long ends, DOUBLE LOCK SEAM in throat or under side of Elbow.

HANDSOMEST, HEAVIEST AND STRONGEST STOVE PIPE ELBOW MANUFACTURED.

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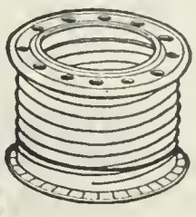
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Sketches and Designs for Stove Work of all kinds.

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FOR PARTITIONS AND CEILINGS.

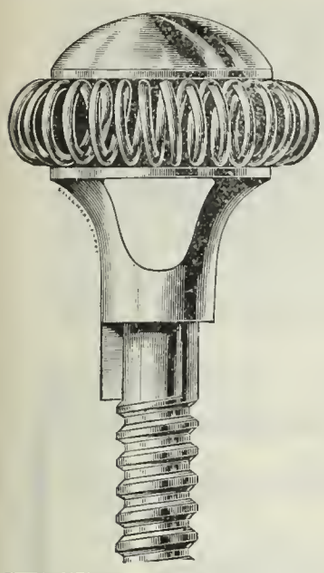
Can easily be adjusted to any thickness of wall, and when screwed up tight against plaster will not work loose and allow the plaster to crumble and fall.

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No. 346 Draft Register.

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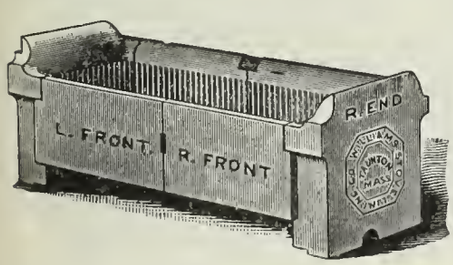
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Dealers are invited to send for circulars.

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Save Your Shipping Tags.

Return 200 of our special **IDEAL PREMIUM TAGS,**—attached to all repair orders, shipped or delivered, and receive **free, a 1000-mile mileage book** on any railroad within that distance of Philadelphia or Baltimore.

Write us for further particulars and plan.

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TEN BELOW ZERO DOES NOT BOTHER THE

RICHMOND

HEATER.

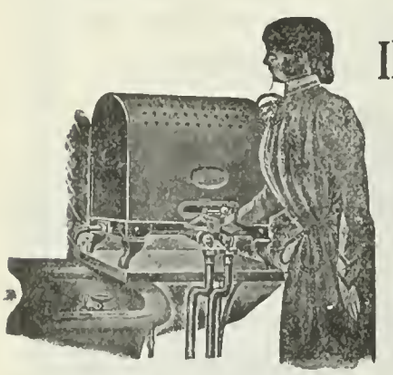
IT IS EFFECTIVE IN ALL KINDS OF WEATHER. POWERFUL, ECONOMICAL, EASY TO REGULATE, DURABLE.

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RINGS.

SPECIAL TUBING.
Cut to Length and Plated.
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SOLICITED.
Quality and Finish the Best.
The Kirk Manufacturing Co.,
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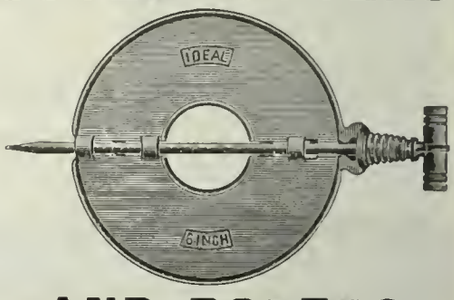
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Is the cheapest, the most efficient and the neatest Water Heater made. It occupies but little space and is always ready, furnishing hot water in a few seconds day or night.

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IDEAL DAMPERS, COVER LIFTERS



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HAVE NON-HEATING HANDLES OF ELEGANT DESIGN AND FINISH. THEY ARE THE BEST.

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THE S. & S. PATENT
Stove Pipe Thimble



Locks the Pipe from Pulling Out, and from Pushing In and Closing the Draught. Will last a lifetime. Nothing to wear out, and costs but a trifle. *Send for sample* and prices.

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PATTERNS
FOR STOVES AND HEATERS.
First-class in wood and iron.
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Two Grades: "North Carolina" and "Nevada."
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OUR "BLACK DIAMOND" artificial abrasive wheels are especially adapted for
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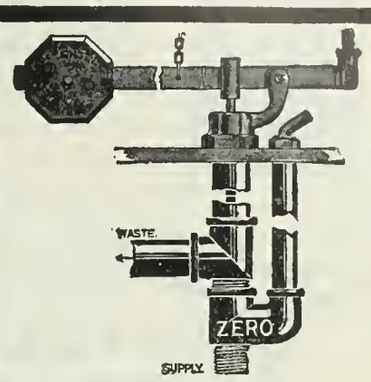
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ARCTIC STOVE TRIMMINGS.



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SAVE HALF

The expense of installing closets by getting

Zero Anti-Freezing Valves.

They can be put in with half the time and half the labor because they do not require a pit or vault.

They are simple and durable in construction—made without screws, springs or pins.

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High and Low Pressure
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Iron Pipe 1-2 inch to 6 inch Inclusive.

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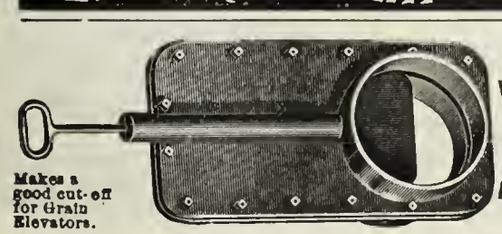
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Makes a good cut-off for Grain Elevators.

IMPROVED
WIND-GATE
SEND FOR PRICE-LIST AND DISCOUNT TO
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— ANSWERED DESCRIPTION. — "That new reporter must be a humorist."

"How so?"

"Why, when the editor told him he would expect him to furnish a double headed article he came lugging in a barrel and said that was the only one he could find."—*Philadelphia Bulletin.*

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"Beg pardon, lady," replied Hungry Hawkes, "but I didn't suppose you'd have dinner over dis early in de day. You ain't very stylish, are yer?"—*Exchange.*

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Pa: "It's a family tree, I guess."—*Exchange.*



Common Sense Circulator AND Radiator.

A FUEL SAVER.

This heater is so simple that its superiority over all others is plain. Being open at each end, the cold air is taken in at the bottom, passing out heated at the top, producing a constant circulation unequaled by any radiator, is easily cleaned out and if necessary can be repaired by any tinner. Takes the place of a joint of pipe 6 or 7 inch, outer casing 10 and 12 inches in diameter. Made of Wood's Refined and American Russia Iron. Can be used on pipe in back of stove with any kind of fuel. It is the best heater made. Patronage of Stove and Hardware Jobbers solicited. If the house you buy of cannot supply you send direct to me. I am not looking for Department Store or Mail Order trade. Patent applied for.

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BOSTON ADJUSTABLE BRACKET

For Sinks and Trays.
Can be adjusted both vertically and laterally.
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GALVANIZED STEEL and WOOD TANKS.

All sizes and shapes.
J. H. EDWARDS,
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LEAD PIPE, SHEET LEAD, SHOT

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Machine cut, at less price than can be cut by hand. Send Sample for prices.

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This PIPE WRENCH
is drop forged and built for hard usage. Does not crush, slip, or lock. All parts interchangeable. Send for catalog showing complete line.

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Miss Sharpe: "Well, I believe she did say you looked as if you 'had been shot at and missed.'"—*Exchange.*

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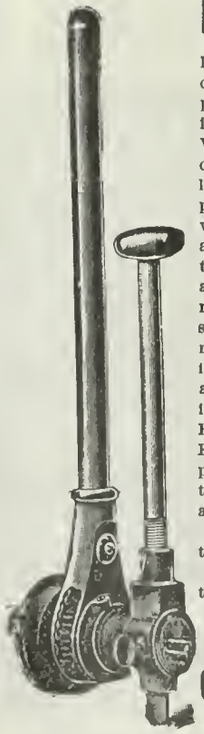


$4.50 NET.

If you are looking for a Fire Pot or Torch, send for our catalog. It's free and is worth dollars to you. It tells all about the largest line of Fire Pots and Torches in the world. Your nearest jobber will supply anything we make at factory price. REMEMBER, if the Fire Pot or Torch you purchase bears our name, it means your money back if it does not please.

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The Climax



RATCHET STOCK

Is an indispensable tool for conveniently threading iron pipe in ditches, under floors in corners, over head, etc With this tool threads can be cut without removing whole lengths of pipe. This tool is provided with a strong vise which securely grips the pipe and by means of the leading thread the die is forced on pipe and the thread is cut. It is made of malleable iron and steel, and while light in weight making it convenient to carry is very strong and rigid. The advantages of this tool make it absolutely indispensable to Plumbers, Steam and Gas Pipe Fitters, Gas and Water Companies, Machinists, etc. It takes standard size dies, which are extra if furnished.

No. 1 threads ¼ to 1 in. pipe takes 2 or 2½ in. die, $10.00.

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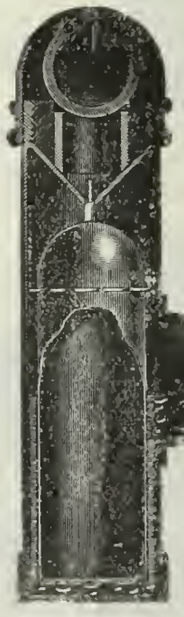
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Plumbers' Force Pumps,
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ALL SIZES OF
Galvanized range boilers, expansion tanks and boilers with copper tube coils inside for heating water by steam.

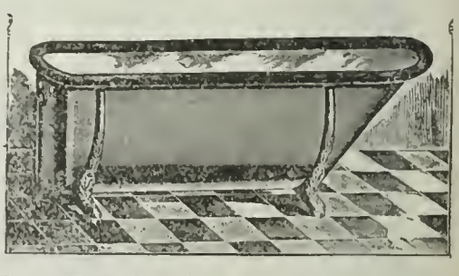
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Is a positive seal against air returning to the radiator. Check being perpetually balanced in water requires no pressure to lift it. A banked fire, with drafts closed will maintain heat night and day in mild weather. Will save four times its cost in a single season.

MORGAN & CO.,
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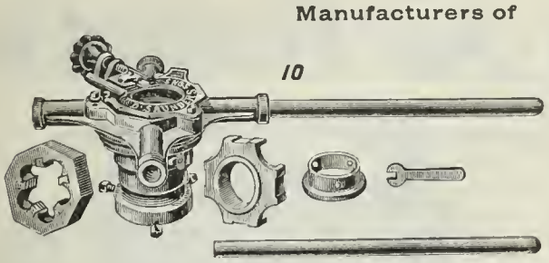
Day Metallic Manufacturing Co.,
DETROIT, MICHIGAN,

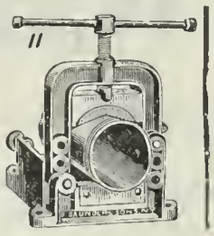
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Steel Enamel and Steel Clad BATH TUBS and HEATERS.

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Manufacturers of





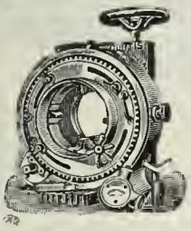
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FOR **LARGE PIPE.** These stocks have ***CUTTING OFF ATTACHMENT,*** and both Vises and Stocks are Malleable Iron. Light, strong and of superior design and finish; also ***PIPE THREADING MACHINES*** ¼" to 18", Tapping Machines, &c.

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FORBES PATENT DIE STOCK



And one man can, with ease,
Cut off and thread a 12-inch pipe.
Smaller sizes proportionately easy.

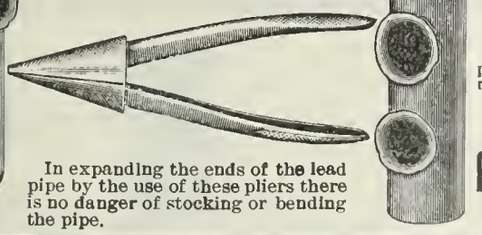
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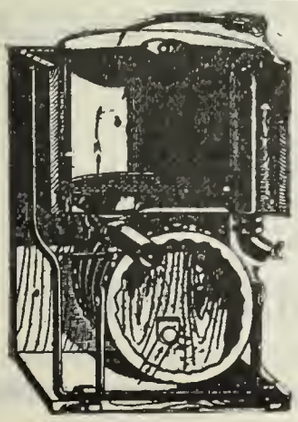
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PARTIAL SUMMARY OF CONTENTS BY CHAPTERS.

Chapter I.—Furnaces—Is devoted to Furnace Construction—The Relative Proportion of Furnace Parts—Secondary Heating Surface—Economy and Efficiency—Heating Capacity and Exposed Wall Surface—Manufacturers' Ratings of Their Own Productions, etc.

Chapter II.—House Heating—Compares Furnaces and other apparatus, and describes Method of Setting Brick and Portable Furnaces—Location and Area of Cold Air Supply—Cold Air Rooms and Air Filters—Return Ducts and Air Circulation—Size of Hot Air Pipes—Location of Registers, etc.

Chapter III.—The Combination System—Discusses Heating Distant Rooms with Radiators—Balancing the System—Location of Water Heater in Furnace—Capacity of Water Heaters—Size of Radiators, etc.

Chapter IV—Air—Deals with the Necessity of Ventilation—Water Needed to Moisten Air—Expansion of Air—Velocity of Air in Tubes, etc.

Chapter V.—Heating and Ventilation of Buildings—Considers the Size of Furnaces Required—Fresh Air Room and Supply—Air Circulation—Size of Flues—Use of Stack Heaters—Size of Heating oils in Vent Flues, etc.

Chapter VI.—Heating of Public Buildings, Churches and Stores—Is given to the Size of Furnaces Required—Grate Surface in Ventilated Buildings—Air Supply—Size of Heating and Ventilating Flues—Size of Stack Heater, etc.

Chapter VII.—Fan-Furnace Combination System—Is devoted to Positive Warm Currents from Fan Systems—Location of Fan and Driving Apparatus—How Good Furnaces are Aided by Fans—Types and Efficiency of Fans—Area of Ducts and Flues, etc.

Chapter VIII.—Temperature Control.

Chapter IX.—Estimate and Contract Blanks.

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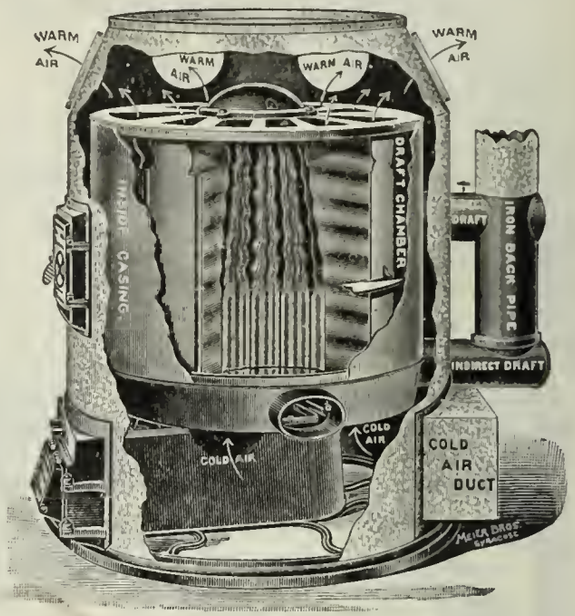
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NEW YORK AND CHICAGO.

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Steady Market for Boilers and Radiators.

The strong favor shown to a stable market in many different lines has been indorsed by the manufacturers of steam and hot water boilers and radiators. At the present time pig iron and the various manufactured articles which go into the construction of boilers and radiators all show a marked advance in price. Consequently if an advance in the price of these goods was made it would be supported by a reasonable basis. In December the manufacturers of boilers and radiators discussed some rearrangement of prices on these goods and the matter was again taken up at the January meeting, when the proposed action was ratified, and it has now gone into effect. Recently many of the manufacturers have withdrawn their prices so that the new lists and discounts might be furnished to all who are in the market for such goods and are seeking quotations. At a meeting of the manufacturers, held this week, the prevailing conditions that seemed to make a further advance in the price of boilers and radiators advisable were thoroughly discussed, and the conservative course was taken to leave prices at the point agreed upon at the December and January meetings. This conclusion has been arrived at with the view of keeping the market stable, a condition which has been found to benefit by far the greater proportion of the buying trade. This course obviates the demoralization which usually attends a fluctuating market. While the opinion seems to be quite general that an advance would be warranted at this time, the desire to avoid any of the disadvantages of a "boom" has prompted a continuance of the prices with which buyers are now familiar.

Scarcity of Fuel and Steel.

The freight car situation, which showed indications of betterment up to a week ago, has again become critical, owing to the recent cold spell, which has further hampered the already insufficient transportation facilities. Advices from Pittsburgh are to the effect that the supply of cars available for moving coal, coke and steel is lamentably inadequate, and these products are fast piling up, so that if relief is not soon forthcoming a widespread suspension of operations among the steel works, blast furnaces and coke furnaces of the district will become inevitable. Mills and furnaces are suffering seriously from lack of fuel, and the coke ovens are becoming congested by accumulating stocks which there are no means of moving. Over 2000 cars of coke are said to be standing in the Connellsville region ready for removal when the railroads can furnish locomotives, and over 200,000 tons are stocked at the ovens. The seriousness of the situation is greater than ever before in the history of the industry, and the outlook for early relief is not encouraging. Railroad officials, while doing their utmost to increase the supply of rolling stock, hold out little hope of betterment until the spring. All the iron and steel manufacturers have their books filled up with orders, many of them of a pressing nature. Consequently the situation is peculiarly embarrassing to both the producers and the consumers. The steel scarcity is becoming acute and buyers are turning to foreign sources for relief. The scarcity of steel is already beginning to have an effect upon some of the finished products; for instance, on sheets, owing to the limitation of the capacity to turn out sheet bars. Structural material, steel rails and other finished products are also showing signs of scarcity. Everything lends emphasis to the conviction expressed in many well informed quarters that prices of all iron and steel products are likely to hold their present level, if they do not move higher, for many months to come, and probably throughout the entire year. Dealers and consumers should take note and govern their purchases of supplies accordingly.

Manufacturers' Prices.

The question as to the basis on which manufacturers' prices should be arranged to the different classes of the trade is one which has often been discussed, but has never been settled. There are those who maintain that the quantity of goods purchased should determine the character of the price given, large quantities receiving a materially lower price than smaller quantities. Others have maintained that it is proper to give those who are ranked as jobbers a lower price without much regard to the quantity of their purchases, while retailers should be called upon to pay a substantial advance on such prices, also without regard to quantity. These two systems have been tried, and are being tried at the present time, and both are found to be encompassed with difficulties and objections. Indeed, to avoid or minimize these the two plans have not infrequently been combined, but even this has not succeeded in meeting the requirements of the case to the general satisfaction of the trade.

At the present time there is an apparent tendency toward a classification of the trade—dividing the distributers of the manufacturers' products into two great classes, jobbers and retailers—establishing a relatively high grade of prices for the retailers, whether large or small, and a materially lower level for the jobbers, who are often subdivided according to the volume of their business into two or more classes, between whom slight differentials in price are made. This arrangement of prices as its natural result encourages the retail trade to make their purchases of the goods concerned from the jobbers rather than from the manufacturers. It is a system which finds very general favor with the wholesale trade, and is regarded as unobjectionable by many retail merchants who are content to confine their purchases to the jobbers. One great difficulty with this

method is the impossibility of drawing a definite line between jobbers and retailers. It is, too, regarded with more or less disapproval by many of the larger retail houses, who buy in sufficient quantities to deal directly with the manufacturer and who prefer the manufacturer as their principal source of supply.

The arrangement of prices on a basis that will conserve the interests of manufacturers, jobbers and retailers alike is a question that is beset with many difficulties. It would be a matter for congratulation if some system could be found which would be satisfactory and just to all departments of the trade. Meanwhile it is desirable that manufacturers, who must look upon the problem in the light primarily of their own interests, should arrange their prices and general methods of marketing goods with a view to the interests of the distributers, both wholesale and retail.

Insufficient Postage.

A matter to which it would be well for American manufacturers and exporters seeking foreign trade to pay more attention is that of postage on letters and other matter sent to foreign correspondents and would-be customers. Complaint frequently comes from abroad of business letters from the United States being sent with short postage, involving the recipient in an unnecessary payment, not only for the shortage, but also the fine which is always imposed in such cases. One business man in Europe is cited as having reeently received in one batch of mail from the United States more than a dozen letters, only two or three of which had proper postage. One letter, which was heavy enough to require 15 cents postage on this side, bore only one 2-cent stamp, with the result that the receiver had to pay, for extra postage and fine, the sum of 32 cents. It is said to be a common occurrenee for Americans to send closed circulars to Europe and other parts of the world with 2-cent stamps, whereas they should bear at least the 5-cent international rate. Each one of such insufficiently prepaid communications involves a minimum expenditure of 8 cents by the person to whom it is addressed. Under the circumstanees it is little to be wondered at that some foreign houses beeome impatient with American methods of seeking business when they are conducted on the inconsiderate lines above indicated. Such remissness certainly does not tend to put the would-be foreign customer in the proper frame of mind to give favorable attention to the circular or other communication inclosed in a package on which he has been heavily taxed. American manufacturers and merchants who have occasion to mail communications to other parts of the world should be careful to see that the proper amount of postage is affixed thereto. It is quite reasonable to suppose that failure in this respect may often have cost the sender a good order. That negligenee of this kind is not confined to foreign correspondence is a matter of common experience among the business men of this country, for the payment of taxes on mail matter received without sufficient postage amounts to a substantial sum yearly in the accounts of many large houses. But the difference to be paid is much larger on insufficiently stamped matter sent abroad, by reason of the higher rates of foreign postage.

Explosions from Accumulated Gas.

It is improbable that more gas escapes during the winter season than during the summer; but during the winter season the basements of buildings through which the gas mains run are kept practically sealed, whereas they are open in the summer with a free circulation of air, so that there is seldom a sufficient accumulation of gas to be either offensive from odor or dangerous in amount. The recent disastrous explosion in a building in Chicago has again brought up the subject for discussion, and the propriety is suggested of the municipal authorities taking some steps to see that not only the gas piping in buildings is kept in proper condition, but also the mains of the gas companies in the city streets. Whenever there is an opening in a street, the offensive odors and the vitiation of the general atmosphere that result beyond question constitute a nuisance that should be done away with. The menace to life and property is greater, however, from the leaks in gas mains in buildings, and steps should be taken to prevent the recurrence of such disastrous explosions and fires as have occurred in different cities from time to time from this cause.

Editorial Notes.

A paragraph in the final report of the United States Industrial Commission submitted to Congress this week contains some suggestive information illustrating the wastefulness of strikes. The Commission state that, as nearly as the United States Department of Labor can reach the facts through its investigators and statisticians, the aggregate loss of wages to employees, as the result of labor disputes, in the twenty years from 1881 to 1900 inclusive, was no less than $306,683,223, or a little over $15,000,000 annually. The loss to employers during the same period from a similar cause is placed at $141,659,104, or rather less than one-half the amount lost by the striking workers. Adding these two losses together, it will be seen that the aggregate loss on account of strikes in the twenty years covered by the statistics quoted, amounts to nearly $450,000,000, or an average of about $22,500,000 annually, or nearly $2,000,000 a month. These enormous figures suggest in a most striking manner the criminal wastefulness of strikes, and provide the best kind of object lesson for the use of those who are now working for the abolition of the strike as a labor weapon, and the substitution in its place of the principle of arbitration and conciliation.

The subject of "public comfort statlons" is again being agitated in New York City, where the comparative absence of such conveniences has long been a matter of ineffectual protest. In another column is reproduced a communication on this head which recently appeared in one of the leading metropolitan dailies and which puts the thing in a rather striking light. In this matter New York is far behind all the great European cities, which make ample provision for the needs of the public in this direction. A deputation of the Women's Health Protective Association waited, a few days ago, upon President Cantor of the Borough of Manhattan to urge that action be taken by the municipal authorities for the establishment of public comfort stations throughout the city, and the President promised to appoint a special committee to investigate the matter with the view of supplying these desirable convenienees. There is, therefore, a prospect that New York may get in line with modern sanitary progress in a matter so important to the comfort, health and morals of her citizens and of the strangers within her gates.

An incident which happened recently illustrates the eagerness with which manufacturers are rushing their improvements. Unable to wait until the frost is out of the ground a company decided to put up steel buildings without putting in the foundations. As soon as conditions are favorable the latter will be put into position.

STOVE CONSOLIDATION AGAIN.

Notwithstanding that nothing authoritative has been given out by those most interested in the consolidation of the interests of a number of manufacturers of stoves, rumors to this effect are rife and persistent. The financial column of a leading New York daily is responsible for the statement that reports from Reading, Pa., indicate that steps are being taken to form a combination of stove manufacturers with a capital of $40,000,000. If this rumor is correct it is a corroboration of the report current a short time since, that a consolidation of stove manufacturers was to be effected in the East that would rival that in the West, which is said to be ready for announcement on March 1. With a rising material market and keen competition a consolidation of the magnitude reported would have a very strong influence against the demoralization of prices and other evils from which the stove trade has been suffering, provided the influence was exerted in that direction. With these rumors comes the report that some of the older and most successful men connected with the leading stove houses in the West desire to retire from active business, and are willing to turn over the labor of conducting these anticipated large enterprises to younger and more vigorous men who are qualified to carry them forward successfully.

THE STOVE AND FURNACE INTERESTS AT THE ILLINOIS HARDWARE CONVENTION.

The stove and furnace trades were well represented at the fourth annual meeting of the Illinois Retail Hardware Dealers' Association, held at Decatur on the 12th and 13th inst. Quite a number of representatives of these trades made exhibits of their specialties in rooms in the St. Nicholas Hotel. Taken collectively, the display thus made was perhaps one of the largest ever shown in connection with a retail hardware convention.

The M & D Range Company, Chicago, pioneers in the manufacture of wrought iron and steel ranges, exhibited three samples. These consisted of one of their standard M & D ranges, their new American steel range and a combination range for the use of both gas and coal. This company were the first to enter the field with a combination range, and although at the beginning much difficulty was experienced in finding customers who would appreciate it, they persevered and eventually built up a large trade. This branch of their business is now so satisfactory that they find such improvements as they introduce eagerly followed by their customers. The combination range shown on this occasion was a strikingly attractive piece of work, being finished with numerous nickeled trimmings, and having a rolling top made of polished steel placed over the cooking holes. This top forms a canopy to be used for drawing off odors when cooking. The exhibit was in charge of J. H. Farquharson.

The Wireton Heating Company, Blue Island, Chicago, exhibited a sample of the Wireton draft regulator, which consists of a clock arrangement by which the opening and closing of a furnace or boiler draft can be arranged for a particular time, thus enabling the draft to be opened early in the morning without the necessity of personal attention. The company further exhibited a line of hot air registers and distributed literature descriptive of their extensive variety of hot air furnaces. The exhibit was in charge of George D. Hoffman, who issued a clever card calling attention to his specialties.

B. C. Millington, representing Taplin, Rice & Co. and May & Fiebeger, both of Akron, Ohio, exhibited the Modern Climax steel range and the Climax hot blast heater, manufactured by the former firm, and distributed catalogues of the Akron air blast furnace made by the latter. He distributed lead pencils advertising the Climax line of stoves and ranges.

The Joliet Stove Works, Joliet, Ill., made an exhibit of five samples of their specialties. The company are originators of steel cooking stoves, which are now being made by so many stove companies. A steel stove was, therefore, a prominent feature of the display. They are also originators of Moore's air tight stove for soft coal, which likewise proved so well adapted to this purpose that the principles of its construction have been adopted by other manufacturers. The company further displayed two steel ranges, one of which is the new Premium range, which they have just brought out and which is a handsome piece of work, representing the most modern ideas in range construction. The heaters shown comprised one of their Moore's air tight stoves for soft coal and an air tight oak hot blast. The latter recently has been brought out by the company and is already meeting with great success. This exhibit was in charge of J. H. Sawyer, Jr., E. H. Mitchell and Carl Phillips.

The Art Stove Company, Detroit, Mich., made quite a large exhibit of their Laurel line of stoves and ranges. The samples shown comprised four steel ranges and two heating stoves. A peculiarity of the range exhibit was the fact that four different sizes were shown of the Twentieth Century steel range, all made on the same principle, but finished differently to conform to the requirements of consumers. These ranges have the company's peculiar flue construction. Instead of being made with a sheet flue, according to the construction usually followed, they have two flues. By the arrangement of two flues underneath the oven, one for down draft and the other for up draft, the heat is evenly distributed, which is claimed to prevent the oven bottom from warping and to secure even baking. The top is also constructed with two flues, which causes the flame to be deflected over the entire top of the stove before passing to the smoke pipe, thus enabling all the cooking holes to be evenly heated. This is an improvement over the old direct draft, which only heats the two front holes. The heating stoves shown were samples of the Twentieth Century Laurel soft coal heater. This heater has a slotted fire pot, enabling a hot air blast to be evenly introduced by means of the slots into the fire pot, thus securing perfect combustion of fuel. These heating stoves are beautifully finished, the shape and decorations conforming to the most modern type of high grade square base burners. George H. Fowler, who was in charge, distributed nickel plated Carrie Nation hatchets as souvenirs.

The Auer Register Company, Toledo, Ohio, exhibited samples of the side wall register brought out by the company a short time back, which has proved exceedingly popular in the hot air heating trade. This side wall register is designed to take the place of the ordinary floor register, and its arrangement is such as to discharge into a room as large a volume of air as a floor register of equal capacity, thus avoiding cutting holes in the carpet and other objections which are held against floor registers. The inventor, George S. Auer, who was in charge, fully explained the merits of his device.

A. C. Selleck, Chicago, exhibited one of his Common Sense fuel savers, which consists of a completely new type of drum or radiator to be attached to a stove pipe. This radiator heats by circulation, as it consists of a number of vertical flues through which the air is drawn from the floor and discharged at the top after being heated.

The Brand Stove Company, Milwaukee, Wis., decorated the watch chains of the members with a gold plated medal, bearing the name of the company and their trade-mark. They were represented by W. B. Lyman and C. L. Franklin.

The Majestic Mfg. Company, St. Louis, Mo., distributed artistic aluminum pin trays. The company's representative was Carl Sommer.

The Estate of P. D. Beckwith, Dowagiac, Mich., manufacturers of Round Oak stoves and furnaces, distributed nickel plated match boxes, having a representation of a Round Oak stove on one side and the famous Indian, Doe-Wah-Jack, on another side. They also gave out stick pins bearing a Round Oak stove so neatly stamped out in sheet metal that it made quite an attractive decoration. They were represented by J. O. Becraft and Robert R. Elliott.

F. F. Porter, Chicago, distributed catalogues of the

Porter warm air furnace, which he manufactures and which is made in four sizes, suitable for coal, coke or gas.

The Peninsular Stove Company, Detroit and Chicago, distributed leather covered memorandum books containing maps of the United States and its foreign possessions, with other useful information. W. T. Whiffen and J. B. Wilson represented the company.

Other representatives of the trade present on this occasion included the following:

John F. Parker, Schneider & Trenkamp Company, Cleveland and Chicago.

John Le Page and Frank S. Hawken, Bridge & Beach Mfg. Company, St. Louis, Mo.

A. Corson, Black & Germer, Erie, Pa.

John C. Buckley, George M. Clark & Co., Chicago.

C. R. Graves, Detroit Stove Works, Detroit, Mich.

James Fentress, Jr., and C. C. Kelley, Cleveland Foundry Company, Cleveland and Chicago.

C. A. Woolley, Cole Mfg. Company, Chicago.

Charles Smith and John V. Patten, Charles Smith Company, Chicago.

WHAT SHOULD A FURNACEMAN KNOW?

BY INDEX.

There are many things that a furnaceman should know, and I am not surprised that "J. K.," in his original article on this subject, has, in the opinion of "C. A. H.," omitted one thing. For the benefit of whoever may be interested, I would say that for ten years I have been cutting from *The Metal Worker* special articles on the different subjects interesting to a furnaceman. These I have kept in a box letter file, which is indexed, and I find under the head of "Air Filters" a description of one of these devices in *The Metal Worker* of April 27, 1895. This consisted of a frame to be covered with cheese cloth to be inserted obliquely in the cold air duct. The area of the frame was about four times the area of the cross section of the cold air box. This was to present so much surface of cheese cloth that it would not especially retard the flow of air. This frame could be withdrawn to have a new piece of cheese cloth attached, or the one in use dusted.

A dust collector was shown in *The Metal Worker* of October 27, 1894, consisting of a series of baffle plates, which would break the force of the entering air current and allow the dust to collect. In *The Metal Worker* of March 14, 1896, was a description of an apparatus for washing, drying and heating the air in the Chicago Telephone Company's building. In the issue of October 10, 1896, the air supply filter used by John P. Schaffer of Pittsburgh was illustrated and described. This consists of a series of frames covered with cheese cloth arranged to be removed for cleaning or renewing. In this device the cheese cloth did not cover the entire frame, but left a space so that air could pass through the frame at one end. These frames have an opening left alternately at opposite ends and serve as baffle plates to catch the dust, while also screening the air. A description of an air filter is given in *The Metal Worker* of October 28, 1893, in which a long piece of cheese cloth is threaded over several iron pins, so as to present a large surface and not interfere with the inflow of the air. This was designed to be placed in an enlargement of the air supply duct.

So much for the methods of cleaning air which have appeared in *The Metal Worker*. I hope, however, that others who have experimented along this line will send sketches and descriptions of their devices. In the section of country in which I am located it is not so necessary to filter the air as it is in soft coal districts; consequently I have had no personal experience except that of observation when traveling and visiting other furnacemen. The only drawback that is commonly reported is that unless the air filter is either renewed or cleaned frequently it will stop up and cut off the air supply to the furnace, causing the furnace to be overheated and damaged. It is generally conceded that unless the air filtering device is in the house of an intelligent person, who will superintend it, or who employs servants, whose business it is to keep the filter clean, it is more of a disadvantage than a benefit. From the different devices that I have seen, if I had occasion to use an air filter, I should favor that used by Mr. Schaffer, in which the filter does not cut off the air supply, but acts both as a screen and a baffle plate. The device, as I have before mentioned, was described and illustrated in *The Metal Worker* of October 10, 1896.

LACK OF PROFITS IN THE GAS STOVE TRADE.

BY W. R.

The fact that gas stoves are selling at less than they were three years ago, notwithstanding a general increase in the cost of sheets, wire, pig iron, coke and labor, would indicate the wiping out of the trade margin of profit quite generally. That something has happened in this line is pretty clearly indicated by the recent Western consolidation of some nine concerns making gas as well as gasoline stoves into the American Stove Company. These companies are seeking to protect themselves from mutual competition, especially in the cheaper grades, and to economize in operating expenses.

The gas stove trade is peculiar in that it is almost a monopoly, usually controlled by the local gas company. The gas companies usually start in by handling the gas stoves at either actual cost or at a positive loss—the sole object being to sell more gas, and for this purpose to get out as many stoves as possible. This clientage has clubbed down the leading manufacturers to the lowest possible selling price throughout a varied line of the cheaper grades.

During the past three years coal stoves have been advanced 30 per cent., yet the gas stove side has been cut down in the face of a rising material market to the point of a uniform loss. On top of this has come a reclassification of freight rates advancing gas stoves from third to fourth class.

Many of the largest stove companies declare that, were it not for their coal stove side they would be driven into bankruptcy. It is clear that something must be done to make the business self sustaining at least. Self protection would seem to require a 10 per cent. increase, meeting the new year's list of the steel cook stove makers, who are now talking of another 10 per cent. lift.

Reliable Gas Stoves and Ranges.

We have received from the Schneider & Trenkamp Company of Cleveland, Ohio, a copy of their 1902 catalogue of Reliable gas stoves and ranges, which they manufacture in sufficient variety to meet all reasonable requirements. The catalogue consists of 104 pages of letterpress, profusely illustrated and printed in an attractive style. This is the thirteenth annual gas range catalogue which the company have issued, and within its covers, the manufacturers state, they have grouped together a line of stoves and ranges which, through their quality and merit, have established an enviable reputation in the stove market. The company's policy always has been to progress, to introduce new ideas and improvements possessing real merit, and, by giving constant and careful attention to every detail of manufacture, to maintain the pre-eminent qualities for which their goods are famous. The gas ranges shown include sizes large and small, the former being such as to meet the requirements of hotels, restaurants and other places where it is necessary to cook food for many people. The ornamentation in many cases is exceedingly rich and effective, while the attractive features embodied are of the latest and most approved type. In addition to gas ranges, attention is given to gas laundry stoves, hot plates, nursery stoves, shop furnaces, tailors' iron heaters, high shelves, canopies, warming closets, circulating boilers, natural and coal gas burners, ovens, broilers, stew pans, waffle irons, sad iron heaters, &c. Some important points to bear in mind when ordering combination ranges are presented, together with a telegraphic code, alphabetically arranged.

A Stove Repair House.

C. C. Heath & Co., Philadelphia and Baltimore, have at their new Philadelphia store and warehouse, 136 and 138 North Second street, one of the best equipped stove repair departments in that city. The entire second and third floors of the building are devoted to repairs, over 4000 bins having been erected on these floors for the storage of castings, &c., with sufficient space left for several thousand more. Electrically driven drills and other machinery have been installed for special work, and all portions of the department are roomy and well lighted.

The company have on hand a line of stove repairs of all kinds, and to further introduce this branch of their business are making the trade an inducement by attaching to each shipment of repairs what they designate as their "Ideal Premium Tags," redeemable when returned in quantities of from five to 200; the latter quantity entitling the holder to a 1000-mile book on any railroad within that distance from Philadelphia or Baltimore. They have now in course of preparation a catalogue devoted entirely to stove repairs, which will soon be ready for distribution to the trade.

Jewel Gasoline Stoves.

The catalogue of gasoline stoves which has just been issued by George M. Clark & Co. of Chicago, Ill., covering the season of 1902, is a neatly printed affair of 32 pages, bound in paper covers, the front one of which is finished in imitation of a door, the grain of the wood being faithfully reproduced and showing the old style of wrought iron hinges with which the doors in the days of our forefathers were provided. This is the twentieth "annual greeting" which the company have issued, and within the covers of the publication attention is invited to the long list of gasoline stoves offered under the name Jewel.

The assortment includes two new steel ranges made with and without high shelves, these being modeled after the Jewel Pressed Steel Never Break gas ranges, brought out by the company last year. To these the makers have applied the old and tried Jewel smokeless generator and similar burners to those used on their No. 85 range. They have two burners on the step so that a wash boiler can be readily heated. Other goods offered include a line of seven smokeless generator stoves, five generator stoves, seven Acme stoves and three evaporator stoves, all embodying features which cannot fail to impress the dealer. The company also offer a new circulating water heater and a new instantaneous and portable water heater, both with gasoline generator attached.

These goods, in connection with others, are illustrated and described in a way to appeal to the dealer, as well as to the user; and in connection with the descriptive text are to be found dimensions, sizes, &c. Baking ovens, burners, camp and yacht stoves, broilers, toasters, &c., are also considered. A copy of the manufacturers' guarantee is presented, as well as some valuable suggestions regarding repairs. The concluding feature of the publication is an index giving weights, prices and telegraphic code words. The matter has been arranged with a good deal of care, and gives evidence of a due appreciation of the requirements of the trade.

ODD PLATES.

The Peninsular Stove Company, Detroit, Mich., are sending to the trade a card printed in colors devoted to their Peninsular Hot Blast Furnace with a cast iron radiator. The card is principally occupied with a view showing a Furnace in a cellar and a unique method of supplying it with air.

The Weir Stove Company, Taunton, Mass., have issued a circular of their new Solar Glenwood Furnaces, for which they make strong claims. Among the constructive features may be mentioned the triangular grate, steel radiator, large ash pit door, with dust pipe carrying the ashes and dirt into the chimney, and a regulating damper of novel arrangement. The Solar steel radiator is so planned that the products of combustion must pass through a flue, which extends its entire circumference, before reaching the smoke pipe. The steel which forms the inside wall also constitutes the round chamber in the center of the radiator, thus giving a large amount of steel radiating surface, while insuring a heater of great power. The manufacturers request dealers and others interested in their specialties to write them for an illustrated pamphlet of many New England homes heated by the Glenwood.

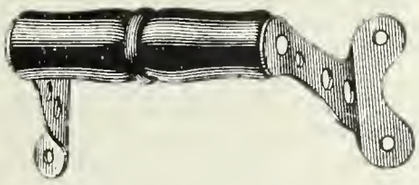
The Cleveland Steel Range Company, Detroit and State streets, Cleveland, Ohio, are sending out to the trade a copy of an attractively printed publication of 20 pages, calling attention to the Ideal Gas Ranges, which they manufacture in many varieties. The manufacturers state that the Grand Ideal line of Ranges has been improved and new patterns have been added to the assortment. The goods illustrated and described include the Gem Ideal, a single oven Range with four top burners, and a double line burner to the oven. The Range is also made plain in two sizes and with water heater. The Grand Ideal has a single oven, and is made in two sizes in the usual modifications. The manufacturers call attention to a number of constructive features embodied in this Range, and present illustrations of the gas burners which are used in connection with them. The Grand Ideal is of handsome appearance, cast ornamentation in conjunction with nickel constituting the exterior decorations.

Samuel B. Sexton, Jr., of the firm of S. B. Sexton & Son, Stove manufacturers, of Baltimore, Md., tendered a supper to about 200 employees of the firm last week in the salesrooms of the concern. The entertainment was given in celebration of the departure of Mr. Sexton for Europe with his wife and daughter on a pleasure trip. The party sailed from New York on February 8, and will visit Southern Europe and parts of the Orient.

The Cuyahoga Stove Repair Company, Cleveland, Ohio, have secured a large building site on the Wheeling & Lake Erie Railway tracks, that city, and are having plans prepared for a foundry building 100 x 125 feet and one story high. It is to be built in such a manner as to admit of its being doubled in size in a short time.

Wash Boiler Handle.

In the accompanying illustration is shown a new wash boiler handle that is being manufactured by Berger Brothers' Company, Philadelphia. The handle is claimed to possess unusual strength, and it is made of



Wash Boiler Handle.

the best materials. The metal parts are heavily tinned, and the handle is finely finished. It is made in two styles, one for round and the other for square end boilers. The manufacturers state that they are prepared to mail a sample of the handle for inspection to any one interested, and tinware makers are specially invited to correspond with them for particulars as to prices, &c.

Keeping Windows Free from Frost.

A correspondent of the *Electrical World* tells of a new use for electric fans. "Passing along Van Buren street in Chicago," he writes, "I noticed the windows of the shops were so thickly incrusted with frost that it was impossible to tell what business the proprietor of the shop was engaged in. Suddenly, at Wabash avenue, a large, attractive looking window of a sporting goods house burst into view with everything in it as plainly visible as it would be on a bright midsummer's day, only more prominently emphasized on account of the condition of its neighbors. I noticed an electric fan in the window running full blast. I stepped in and asked

the proprietor if the fan was used to keep the window free from frost. He stated that that was its object, and that it worked splendidly. In the morning when they found the windows covered with frost they turned on the fan, and the frost was rapidly cleared off, the window remaining clean and dry all day."

THE GURNEY REFRIGERATOR COMPANY.

A thoroughly modern plant for the manufacture of refrigerators is the new factory of the Gurney Refrigerator Company, Fond du Lac, Wis. This factory takes the place of the old works of the company which was burned April 27, last year. Immediately after the fire arrangements were made to rebuild, and the first refrigerators were turned out in the new plant about October 1. The company are exclusively manufacturers of refrigerators, and give this business their entire time and thought. They are continually bringing out new ideas, and their enterprise is shown not only in the character of the goods they manufacture, but also in the design and arrangement of this new plant, which is one of the largest in the country. The capacity of the factory is now 200 refrigerators daily.

The works occupy an entire city block. The main building covers a ground space of 175 x 195 feet, part two and part three stories high. This building is solidly constructed of brick with high ceilings, all the interior whitewashed to secure abundant light, and protected by an underwriters' pump, sprinkler system, fire walls, automatic closing doors and electric alarms to guard against a repetition of their former experiences. So thoroughly protected is this building that the rate of insurance is but one-eighth of the rate in the former factory. In it all the milling, assembling and finishing of the refrigerators are performed.

The company have their own lumber mills in Wisconsin and do their own logging and sawing of lumber, so that their works cover the entire process, from the tree to the finished product. They have no large stock of lumber in the vicinity of their factory, but receive regular shipments by rail from their saw mills, and pass this lumber rapidly through the various departments.

The tracks of the Chicago & Northwestern and the Wisconsin Central railways run through their yard, and the lumber is unloaded directly from the cars on cars with low trucks and run into the dry kilns, which are in a detached building and are of sufficient capacity to hold 175,000 feet of lumber. From the kilns a car with dry lumber goes directly into the factory. No hauling is done by teams, but everything is handled by cars. In the factory the lumber first goes to the planer on the ground floor and then to other departments, where it is cut into proper widths and lengths and run through a variety of ingenious machines. All the milling or heavy work is done on the ground floor and the materials all pass steadily in one direction. Here are also great sanding machines for thoroughly smoothing the surfaces of side and front panels and doors after they have been assembled by cabinet makers on the second floor. The shavings and sawdust from the various machines are drawn through pipes passing from each machine, which are so arranged that they finally discharge this refuse into the arch of the boiler furnace, forming practically all the fuel needed. Even the sweepings from the floors are drawn into this system.

In designing this building a very large elevator was arranged in the exact center of the structure, so that the various departments might be grouped around it, making the elevator the point to which all operations would tend and thus save time and labor in passing from one process to another on different floors.

The ground floor further contains the power room, store room, machine shop and a large filing room. The power room is equipped with a Corliss engine, which operates nearly all the machinery, and a small engine, which is used for running a 300-light dynamo and the fans for hot air heating. The entire building, except the varnish room, is heated on the Sturtevant hot blast system. The exhaust steam from the engine room passes through a large coil of pipe through which air is forced by fans, one set of discharge pipes leading into the various rooms of the factory and another set into the dry kilns. The stock room is used for carrying the stock of zinc, insulating materials, nails and other articles needed in the construction of the refrigerators, apart from the lumber. The machine shop is fitted with a full equipment of iron working tools, and is used for repair work and for building special machines of the company's own design for certain classes of their work. The filing room is equipped with automatic machines for filing and setting saws.

The second floor is used for a number of departments, prominent among which is the room in which cabinet makers make the sides and doors and assemble them into box form for the outside cases. Individual glue pots heated by steam are placed at each workman's bench. This department is supplied with machines for embossing moldings for decorative work, with drills operated by flexible shafts and other interesting machines specially adapted to the class of work required.

All metal work is done on the third floor. This department is fitted with shears, folders, gang punching machines, corrugating machines and other tools for handling the metal linings and the metal for ice compartments, shelves, &c. The removable galvanized ice compartment, of which this company are the originators, has its sides made in separate pieces, each of which has a large number of holes punched along the top. These holes are all punched at one time on each sheet by a multiple punching machine, and at the same time this machine presses the sheet in shape to be formed into a box. The inside sections are made here, the zinc linings are inserted and soldered, the mineral wool and other insulating materials are inserted and the process is advanced to the stage at which the addition of the outside casing can be made. Two enameling ovens for enameling interiors of refrigerators are on this floor.

From the assembling room on the second floor a procession of boxes is steadily moving into a room called the filler room, where the first coats of varnish are applied. They next pass into a varnishing room heated by steam for the purpose of keeping it absolutely free from dust. The crating room adjoining is the room in which all refrigerators are crated for shipment, the locks and hinges being fitted on the boxes just before crating.

From the crating room an elevated passageway runs to the warehouse, which is 150 feet from the main factory. This warehouse is four stories high, has a capacity for holding 20,000 refrigerators and is located along the tracks of three separate railroad systems—namely, the Chicago & Northwestern, Wisconsin Central and Chicago, Milwaukee & St. Paul. From this warehouse all shipments are made, even local shipments being made by car instead of by wagon. This building has been constructed to be thoroughly fire proof, being built of solid stone. The offices of the company are located in a separate building erected for this purpose and handsomely fitted up. It contains five apartments admirably arranged for the convenience and efficiency of the clerical force.

All the refrigerators made by this company are constructed of hard wood in golden oak finish and have raised panels and raised carvings. The company make five lines in all—namely, the Gurney, Cold Wave, La Belle, Imperial and Enamel. They are also bringing out a glass line. The refrigerators are sold through jobbing representatives in every part of the country. A large shipment has just been made to Honolulu. The founders of the company are still active officers of the organization, as follows: C. J. Medberry, president; David Jack, vice-president; M. J. Peck, secretary and treasurer. They established the business in 1880 at Oshkosh and removed to Fond du Lac in 1881.

The Berger Mfg. Company, Canton, Ohio, are distributing a circular giving a cut and description of their Side Lift Tubular Lantern. A new feature of this Lantern is that the frame is constructed of one piece, corrugated, crimped tubes. An illustration of the Lantern gives a good idea of its general make up and attractive appearance. The company urge buyers to place their orders for these goods now, in order that they may not be crowded out later.

ILLINOIS RETAIL HARDWARE DEALERS' ASSOCIATION.

The annual convention of the Illinois Retail Hardware Dealers' Association, which was held at Decatur on Wednesday and Thursday, February 12 and 13, was probably the most interesting and important meeting of that body that has ever assembled. The convention hall was crowded when the assemblage was called to order by President Cormick. Mayor C. F. Shilling gave the visitors a warm greeting to the city and was replied to on behalf of the asociation by D. McLaughlin of Chicago.

On roll call by Secretary G. R. Lott, 93 firms were represented by members in actual attendance. The secretary then read the following list of appointments on committees:

LOCATION OF NEXT PLACE OF MEETING: J. M. Hunter, Peoria; Leon Nish, Elgin; W. J. Krueger, Chicago; L. H. Clark, Rockford; F. W. Siecke, Freeport; H. N. Murphy, Galesburg; Z. T. Miller, Bloomington; C. M. Hurst, Decatur.

FINANCE AND AUDITING: Leo Krueger, Chicago; F. B. McKinney, Rockford; D. Refior, Ottawa.

RESOLUTIONS: L. Bapst, Kankakee; Charles H. Williams, Streator; W. T. Gormley, Chicago; Geo. A. Neeb, Chicago; J. L. Hudson, Springfield.

BY-LAWS: F. F. Porter, Chicago; G. B. Churchill, Galesburg; L. M. Reeves, Peoria; J. D. Barnett, Decatur; J. H. Vawter, Salem.

NOMINATIONS: D. McLaughlin, Chicago Wm. Dittel, Peoria; R. G. Schuerer, Vandalia; Chas. McGuire, Rockford; Fred. Kurtz, Chicago.

PRESS: W. B. Costello, Chicago; H. H. Roberts, Chicago.

QUESTION BOX: D. E. Styles, Momence; J. Bellamy, Sandoval; J. L. Smith, Chicago.

WEDNESDAY AFTERNOON.

In the afternoon President Cormick read his annual address, which was received with hearty applause, and Secretary Lott read his report, showing a total membership of 230. The report of Treasurer F. F. Porter, Chicago, showed receipts during the year of $854 and disbursements of $654, leaving a balance of $199. M. L. Corey, secretary of the National Hardware Dealers' Association, was then introduced and delivered a very interesting address, dealing with the work of the national organization.

Leon Nish of Elgin and other members spoke against the Parcels Post Bill now under consideration by Congress, and advised earnest work to defeat it. H. C. Peppler of Chicago read a paper on "Co-operative Buying," which was discussed, and followed by a paper on "What of the Future?" by Z. T. Miller of Bloomington.

THURSDAY MORNING.

The proceedings began with the reading of a paper on "Local Associations," by L. H. Clark of Rockford, which was discussed by a number of the members. A paper on "Paints" was presented by D. McLaughlin of Chicago.

Mr. McLaughlin prefaced his paper with the statement that he had formerly devoted considerable space in his store for storage of Stoves during the summer, but he found that the business had many objections. The store was frequently untidy, and no matter how careful he might be there was always something missing or broken, according to the customer, when the Stove was called for in the spring. He decided to discontinue the storage of Stoves and to put in a stock of something to take the same space. After fully considering the subject he concluded to put in a stock of Paints. On investigating the matter thoroughly, and taking the advice of a Paint manufacturer, he put in a stock of $600 worth of Paints and Oils. He shortly afterward found that this was hardly enough and he now carries a stock of $900. The business is so satisfactory that he would not run a Hardware store without handling Paints. He considers that Paints naturally go with Hardware. The stock is always clean, attractive in appearance, easily handled, and yields a satisfactory profit.

Mr. Gnadt of Chicago controverted Mr. McLaughlin's position relative to Stove storage and gave his method of keeping track of the condition of a Stove when received, which avoids all trouble.

Mr. Fahey of Decatur agreed with Mr. McLaughlin, stating that extra help must always be hired to haidle Stoves on storage, and that the cost according to his experience was so great as to leave little profit.

William T. Gormley of Chicago subsequently presented an interesting paper on "Benefits of Organization," which was followed by a discussion of the builders' hardware question, which was participated in by a number of speakers.

THURSDAY AFTERNOON.

Vice-president William Bittel, Peoria, took the chair, in the absence of the president, who was engaged on committee work, and Charles H. Williams of Streator read a paper on "Mental Equanimity."

F. F. Porter, chairman of the Committee on By-Laws, recommended the following additional section, which was unanimously adopted:

Section 8. Any member who shall be in arrears one year's dues shall be dropped from the rolls of this association, but may be reinstated to full membership by paying in full all arrears before or at the next annual meeting.

Resolutions on the death of Otto Schulte of Freeport were presented by Charles H. Williams of Streator, and adopted. On motion Bloomington was adopted as the place for holding the next meeting of the association.

D. McLaughlin of Chicago, chairman of the Committee on Nominations, reported the following list:

ELECTION OF OFFICERS.

PRESIDENT, H. G. Cormick, Centralia.

VICE-PRESIDENT, Daniel Holder, Bloomington..

SECRETARY, H. L. Clark, Rockford.

TREASURER, F. F. Porter, Chicago.

EXECUTIVE COMMITTEE: H. G. Cormick, Centralia; Daniel Holder, Bloomington; L. H. Clark, Rockford; F. F. Porter, Chicago; Z. T. Miller, Bloomington; W. T. Gormley, Chicago; H. N. Murphy, Galesburg; Charles Mauer, East St. Louis; R. G. Schuerer, Vandalia; F. W. Siecke, Freeport.

INVESTIGATING COMMITTEE: G. R. Lott, Chicago; F. Giessing, East St. Louis; L. M. Reeves, Peoria; M. Fahey, Decatur; M. Seaman, Greenville.

LEGISLATION COMMITTEE: C. W. Zumbrook, Springfield; William T. Gormley, Chicago; David Riefor, Ottawa; H. G. Bagby, Tuscola; J. A. Hunter, Peoria.

The report was unanimously adopted. On motion, the secretary cast one ballot for each of the officers, and they were declared duly elected.

The Committee on Nominations also recommended that H. G. Cormick and G. R. Lott be chosen as delegates to represent the association at the next meeting of the National Association. The recommendation was adopted.

President Cormick then addressed the convention and expressed his thanks for re-election and his appreciation of the honor which had thus twice been conferred upon him. Other addresses were made by Mr. Broderick of the American Wringer Company, George D. Hoffman of the Wireton Heating Company and W. H. Bennett of the Reading Hardware Company, upon the work of the association.

QUESTION BOX.

The Question Box was then opened and a number of interesting queries were propounded and discussed. Among them were the following:

Do we favor the complicated manner of s ove manufacturers in numbering and naming their stoves, to the detriment of our business in gaining the correct name and number from our customers in getting repairs?

This question brought out quite a long discussion, in which Messrs. Bagby of Tuscola, Cormick of Centralia, Fahey of Decatur, Clark of Rockford and Styles of Momence participated. The point was drawn out that the great difficulty encountered by a dealer was to secure from his customer the correct name and number of a stove for which repairs were desired. President Cormick stated that he uses a blank, which he requires his customer to fill, and finds this method quite satisfactory.

Mr. Fahey stated that he is often obliged to educate a customer how to find the name and other necessary details to describe his stove. Records of all customers are kept, as well as the stoves for which they have ordered repairs, and this frequently facilitates business of this character.

Mr. Clark uses a card index system. These cards have blanks on them, showing all details required, and after they are filled by the customer they are deposited in a box made for the purpose, and these boxes are run in monthly series. Track is thus easily kept of the repairs in transit, and after the repairs are received the card is transferred to another box, in which it remains

on perpetual record. He found the card system much more satisfactory than a book.

Mr. Styles asked if anything had been done to induce stove manufacturers to confine themselves to collars of regular size; for instance, to 5, 6 or 7 inch instead of 5½, 6½, &c.

President Cormick said this matter was too large a question for a State association to handle and belonged to the National Association. On motion the matter was referred to the National Association.

Is it right for outside dealers to give an agent orders for stoves or any other articles to be sent to his home town for himself or friends?

Interesting experiences were brought out by Messrs. Porter of Chicago and Cormick of Centralia relative to practices of this character.

The business of the convention having been concluded, an adjournment was taken at 4.25 p.m., to meet in Bloomington in 1903.

CHICAGO DELEGATION.

Chicago contributed largely to the success of the convention, sending there a large delegation, not only of retail hardwaremen, but also of the manufacturers, jobbers, salesmen and press representatives, among the latter being:

J. O. Becraft, Estate of P. D. Beckwith
J. D. Warren, J. D. Warren Mfg. Company.
Henry J. Sawyer, Jr., Joliet Stove Works.
George S. Auer, Auer Register Company.
Geo. D. Hoffman, Wireton Heating Company.
Richard H. Gardner, Niles Mfg. Company.
W. B. Lyman, Brand Stove Company.
Evans Nelson, Lawson Mfg. Company.
James Fentress, Jr., and C. C. Kelly, Cleveland Foundry Company.
Louis A. Denoyer, J. L. Perkins & Co.
Stephen M. Perrigo, C. M. Avery & Co.
Robert Aitchison, Robert Aitchison Perforated Metal Company.
M. Brucker, stove repairs.
H. H. Roberts and Geo. W. Cope, *The Iron Age* and *The Metal Worker.*

THE BANQUET.

The local dealers of Decatur showed their appreciation of the selection of their city for the convention by tendering a banquet, which was held at the St. Nicholas Hotel on Thursday evening. A very attractive *menu* was prepared, which, together with a programme of toasts, was printed in pamphlet form, bound in tinted covers and tied with a silk bow.

R. I. Hunt of Decatur filled the exacting position of toastmaster with great credit to himself and pleasure to his hearers. C. H. Williams of Streator responded to the toast, "Illinois as a Hardware State;" H. G. Cormick of Centralia, to "Association Work in Illinois;" Hon. Owen Scott, editor of the Decatur *Herald*, to "Decatur;" R. R. Elliott of the Estate of P. D. Beckwith, to "Mutual Interests of Buyer and Seller;" John F. Parker of the Schneider & Trenkamp Company sang a baritone solo; Daniel Stern, *American Artisan*, responded to the toast, "Twentieth Century;" F. E. Bonney, Paxton Hardware Company, to "Camp Followers;" W. H. Bennett, Reading Hardware Company, to "Don't Irritate;" H. H. Roberts, *The Iron Age*, to "Power of the Press;" L. H. Clark of Rockford, to "The New Secretary;" Carl Sommer of the Majestic Mfg. Company and C. R. Graves of the Detroit Stove Works furnished a musical diversion; Geo. W. Cope, *The Iron Age*, responded to the toast, "Good Fellowship."

The banquet was attended by 150 persons.

McCray Refrigerators.

The McCray Refrigerator Company, Kendallville, Ind., are sending out a new catalogue of the McCray line of refrigerators. This is an exceptionally handsome catalogue of 60 pages, having a specially fine class of illustrations. Some of these illustrations are lithographed in colors to show the uses to which the different compartments can be put. The line comprises refrigerators made wholly of porcelain tiles, others with linings of white glazed tiles and others lined with odorless wood. The illustrations show a large number of styles of all sizes, together with illustrations and descriptions of special refrigerators, which are built to order. In some cases the refrigerators built to order have two ice chambers, thus making two distinct refrigerators in one. The company make a specialty of constructions to meet the most exacting hygienic requirements.

NEW ENGLAND HARDWARE DEALERS' ASSOCIATION.

The New England Hardware Dealers' Association held their ninth annual meeting and election of officers at the Quincy House, Boston, Mass., on February 12. At 5.30 dinner was served, followed by the election and remarks by a number of members upon "The Outlook of the Association." Owing to illness, the president, George W. Burditt, was not able to be present, and the vice-president, Sewall D. Balkam, presided. The report of the treasurer, Henry N. Sanders, showed the finances of the association to be in good condition. Secretary James A. Farless, for the ninth time, presented his annual report.

The Nominating Committee, comprising Samuel H. Thompson, Lowell, Mass.; Edward A. Loomis, Providence, R. I.; William D. Parlin, Natick, Mass., reported as follows.

First vice-president, John H. Sayward, Haverhill, Mass.
Second vice-president, John B. Hunter, Boston, Mass.
Third vice-president, E. Loring Richards, Boston, Mass.
Secretary, James A. Farless, Boston.
Treasurer, Henry M. Sanders, Boston.
DIRECTORS: D. Fletcher Barber, Boston, Mass.; Charles E. Adams, Lowell, Mass.; John M. Fiske, Natick, Mass.; E. C. W. Bliss, Boston, Mass.; Calvin M. Nichols, Dorchester, Mass.; Joseph H. Williams, Boston, Mass.

All of whom were unanimously elected for the next year.

For president, Samuel H. Thompson of Lowell presented the name of Sewall D. Balkam of Jamaica Plain. There was no other nomination and Mr. Balkam was unanimously elected. In accepting the election, President Balkam expressed his high appreciation of the honor conferred upon him and asked for the hearty cooperation of all the members. The motto of the association, he felt, must at this time be "Forward."

Those who spoke on the topic of "The Outlook of the Association" were: Anthony S. Morss, James A. Farless, Edward A. Loomis, Myron H. Tarbox, D. Fletcher Barber, E. W. Bliss, Calvin M. Nichols and E. M. Richardson.

The genial secretary of the association, James A. Farless, was the recipient of numerous congratulations upon the attainment of the seventy-fifth anniversary of his birth, which was reached on the day of the annual meeting, and in return made an interesting talk, in which he gave the members his receipt for a long life and a happy one. The president appointed E. Loring Richards and George J. Mulhall a committee for the March meeting.

Glacier and Defender Refrigerators.

The Northern Refrigerator Company, Grand Rapids, Mich., have issued their 1902 catalogue of Glacier and Defender refrigerators. This catalogue comprises 96 pages, and illustrates a large variety of refrigerators comprising all kinds of constructions suitable for domestic use, as well as special shapes for those requiring refrigerators of large capacity or of narrow width for apartment house use, grocers', butchers' and butter merchants' refrigerators, sideboard styles, &c. Features have been introduced in some of these constructions which are of a specially interesting character. For instance, the butchers' refrigerator has drawers for cut meat, fitted with bottoms made of heavy galvanized wire screens; grocers' refrigerators have roll tops made of double glass for the storage of small cheese and other articles, and the butter refrigerators have sliding trays to enable the contents to be easily drawn out. These refrigerators are both zinc and porcelain lined. A portion of the catalogue is devoted to illustrations and descriptions of the construction of the flues to secure air circulation and other details of fixtures, trap, &c.

The Illinois Roach Trap.

The patent roach trap, herewith illustrated, has recently been placed on the market by J. H. Jones, Streator, Ill. Fig. 1 shows the trap ready for use and Fig. 2 presents a view with the top removed. In form the trap resembles a 2 quart bucket with wire gauze inserted in the lid. The construction is as follows: The bottom is double, thus permitting an opening to be arranged all around the bottom edge, through which the

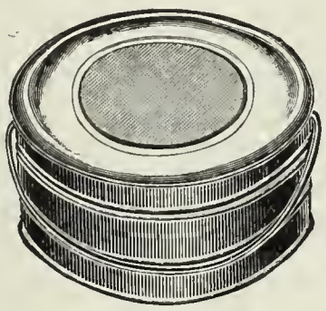


Fig. 1.—The Illinois Roach Trap.

roaches can freely pass into a circular compartment in the center. This compartment has a wire gauze bottom, below which the bait is placed in a tin cup or lid, fitting on the tin wall of the compartment. The roaches are thus unable to get at the bait and cannot return through the openings by which they entered, as these are guarded by sharp prongs. Above the prongs are openings permitting the roaches to pass from the compartment into the top of the trap. They are again unable to escape from this second compartment, as sharp prongs are also placed around the openings through which they en-

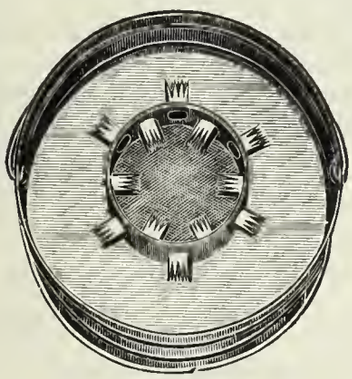


Fig. 2.—Illinois Roach Trap, with Top Removed.

tered. When a number of roaches are caught in the trap they are killed by immersing the trap in water. After the first baiting is done the trap requires no setting or further attention. It is simple in form and is very easily cleaned. The manufacturer states that in more than one instance a single trap has caught more than a quart of roaches in one night. The trap is made of either tin or galvanized iron, as desired.

Stove and Hardware Dealers.

The Enterprise Enameling Company of Bellaire, Ohio, have contracted for an additional plant, 100 x 108 feet, in which they will install all of their stamping machinery. The company's plant is now four times the size it was two years ago, their rapidly increasing trade having made a number of extensions imperative in the interval.

Lyon & Whiting, Milford, N. Y., have been succeeded by the Milford Mfg. Company, who have been incorporated to manufacture the Ball Bearing Egg Beaters and other specialties of the first named firm.

Brock & Co. are a new firm who have bought the stock of J. T. Vance, dealer in Stoves, Furnaces, Tinware, &c., at 20 West Main street, Lexington, Ky. The firm are composed of L. B. Brock, lately coal inspector for the C. N. O. & T. P. Railroad, and Prof. J. H. Connell, director of the Texas Experiment Station. Mr. Brock will have charge of the practical end of the business.

The retail Hardware dealers of East St. Louis, Ill., organized a local association on the 3d inst. All the dealers of that city are members of the association. The officers are as follows: President, Charles Mauer; vice-president, William Goedde; treasurer, Fred. Giessing; secretary, George G. Barbour.

James D. Fleming, who until recently acted as manager in charge of the Chicago branch of the Lalance & Grosjean Mfg. Company, New York, was elected treasurer of the company at the annual meeting, February 13, and will hereafter be in charge of that department at headquarters, 19 Cliff street, New York.

The fourth annual meeting of the Missouri Retail Stove and Hardware Dealers' Association held a two days' session in St. Louis, at the rooms of the Mercantile Club, on Tuesday and Wednesday, the 18th and 19th inst.

The Rochester Stamping Company of Rochester, N. Y., had a fine display Rust Proof Ware, including Nickeled Copper Tea Kettles, Tea and Coffee Pots, Chafing Dishes, &c., at the annual convention of the Illinois Retail Hardware Dealers' Association, at Decatur, last week.

The fifth annual meeting of the North Dakota Retail Hardware Association was held in Fargo, N. D., on Wednesday and Thursday, February 19 and 20.

The third annual convention of the Indiana Retail Hardware Dealers' Association was held at the Denison Hotel, Indianapolis, Ind., on Wednesday and Thursday, February 19 and 20. The convention was a large and successful one. Many new members have joined the association, bringing the membership up to about 300. President W. P. Lewis gave an interesting address and was followed by T. James Fernley, secretary and treasurer of the National Hardware Association. Among the features of the convention were papers on "Hardware Store Arrangement," by J. D. Warren of Chicago, and on "Up to Date Hardware Advertising," by H. P. Townley of Terre Haute.

Efforts for the Abolition of Strikes.

The Executive Committee of the National Civic Federation met in New York City this week and adopted a working basis of operations for the prevention of labor strikes. The main work of the committee was the formation of the Industrial Department of the Federation, which department will deal with labor disputes and endeavor to promote industrial peace and establish harmonious relations between employers and workers throughout the country. The principles expressed in the by-laws of the Industrial Department favor the adoption of mutual agreements and expressly disavow the intention of considering abstract industrial problems. The by-laws contain the following clauses:

Conciliation Committee.—The chairman shall appoint a committee on conciliation, to consist of nine members, three of whom shall be selected from each group, whose duty it shall be, upon notice from the chairman of threatened strike or lockout of more than local magnitude, to use its good offices in restoring harmonious relations, reporting its action to the Executive Committee.

Arbitration.—Should the efforts of the Conciliation Committee prove ineffective, and should both parties to the dispute desire the services of the Executive Committee of this department, they may be invited to select two employers and two wage-earners from said Executive Committee, to serve as an arbitration board. Should the four find it necessary to appoint an umpire to finally decide the dispute they may select a fifth member from the group representing the public.

Emergencies.—Should a controversy seem of such magnitude as to justify such action, the officers shall be authorized to call a meeting of the entire Executive Committee to consider the situation and such action as may, in their judgment, be required.

Auxiliary Committees.—The Executive Committee may appoint auxiliary committees to deal with local disturbances, the rules governing the same to be in harmony with the general purpose of the Industrial Department.

BRITISH HEATING ENGINEERS.

The annual meeting of the British Institution of Heating and Ventilating Engineers was held on Tuesday, January 28, at the Holborn Restaurant, London, with a good attendance. We notice among those who were present several members of the American Society of Heating and Ventilating Engineers, among them being D. M. Nesbitt, W. R. Maguire, J. Nelson Russell, Robert E. Atkinson and Charles F. Hauss, who are also members of the British Institution.

After the election of a number of new members, the election of officers for the ensuing year was then taken up, and the following officers elected:

President, J. Nelson Russell.

Vice-Presidents, F. Dye and E. Taylor.

Secretary, E. Taylor.

Council, the officers, with L. F. Pearson, E. W. Mayner, C. Mason, S. Naylor, J. N. Greenall, W. Yates, G. Crispin and A. B. Simpson.

A paper on "Mechanical Ventilation" was then read and discussed.

MECHANICAL VENTILATION.*

BY W. YATES, M.I.M.E.

Our secretary asked me to read a paper on ventilation. As you will see, I have (paradoxical though it may seem) reduced the scope of such an all-embracing subject by adding to the title the qualifying adjective "mechanical." One reason for this is that I am no believer in so-called "automatic" ventilation. Another is that the principal study of my business life has been the application of fans for ventilating purposes; and I take it that the results of our own practical experience are most likely to be useful to the members of the institution. And last, though not least, it is not possible within the limits of a paper like this to treat adequately even ventilation of the mechanical order, to say nothing of the wider field embraced by the general term "ventilation."

I suppose it is not needful, in reading such a paper before the Institution of Heating and Ventilating Engineers, that I should preface it by saying anything as to the advantages to be derived from ventilation. Still, I think the point should not be passed over; and I would go further, and insist on the absolute necessity of not only our factories and workshops being thoroughly ventilated, but that all buildings—public and private—used for human occupation should have some means of clearing out the vitiated air and being supplied with the purest and freshest air obtainable, if health is to be maintained at the highest standard and life prolonged.

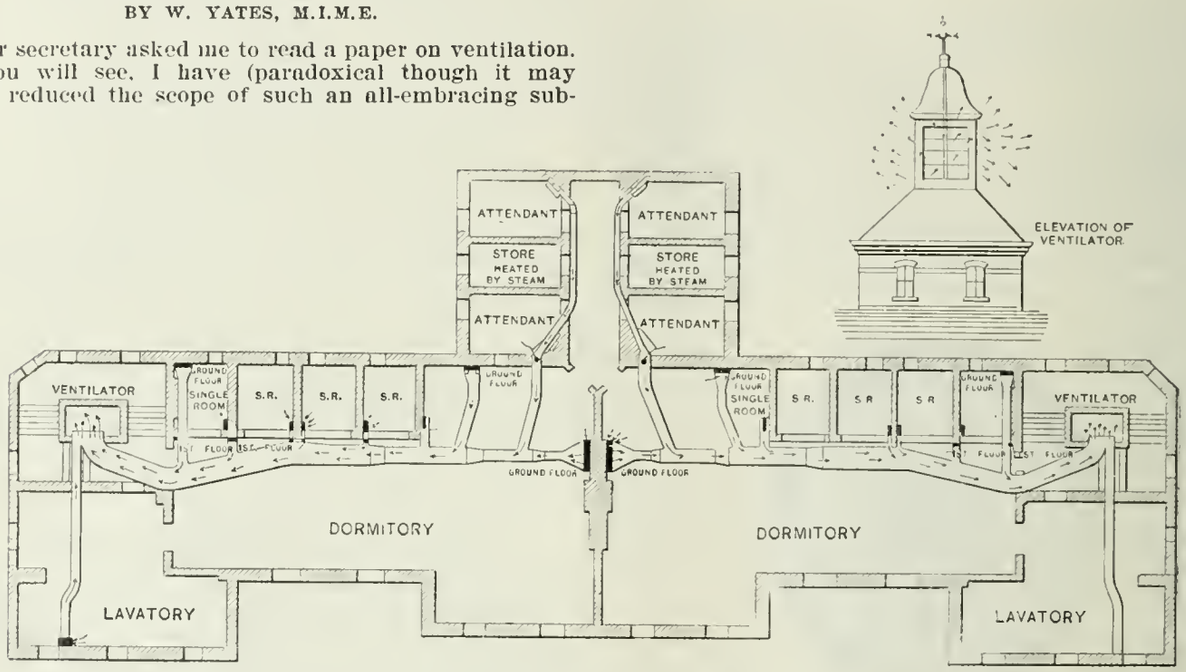
I need only point to the new treatment for consumption to show the great value of fresh air as a cure for tuberculous diseases. And if it will cure surely it is good as a preventive. I think it is incumbent upon us, as ventilating engineers, to press this point upon the unthinking or indifferent public, and thus bring about a change in our conditions of living that is so much needed. I think perhaps the subject may be divided under two general heads—viz., vacuum or ventilation by extraction, and plenum or ventilation by blowing in. Let me say at once—and this a point I wish specially to emphasize—that whatever method is adopted, warming should be taken in conjunction with ventilation, or troubles will almost invariably follow.

THE VACUUM OR EXTRACTION SYSTEM.

This in itself may be subdivided roughly into two methods. 1. The ventilation of single rooms, large or small, where a free outlet can be obtained in a suitable position; 2, the ventilation of a number of rooms collectively, or of single rooms, where a suitable free outlet is not obtainable. I take the simplest first. Let us consider a single room where a suitable and free outlet can be had. A free outlet is, of course, an unimpaired discharge for the fan of the full diameter or area of the latter; and here air propellers or open fans are exactly suited for the purpose. But what, it may reasonably be asked, is a suitable outlet? This must be of sufficient size to give free exit for the air, and must be in a position as far removed from the inlet as possible. At this point, therefore, the question of inlet, or fresh air supply, must be considered. And may I here be allowed to emphasize another truth which, while it ought to be self evident, is frequently ignored—viz., that it is useless to attempt to extract air from a room without adequate means for replacing what is taken out?

In other words, if there is no supply there will be no extraction. The fan will simply churn the air within itself; and just in proportion to the supply will be the extraction, up to the full capacity of the fan. I came across a homely illustration of this fact only the other day. A friend who was sick and feared the drafts placed a draft preventer round his sitting room door and found, to his surprise, that the fire would not burn nor the smoke go up the chimney. There you have the principle in a nutshell. I have frequently come across fans which were said to be useless—and certainly they were, as installed—but in many cases they only wanted a supply of air to the room to enable them to accomplish all that was desired. There must be an adequate supply; then it must enter at the right place. This, as stated, must, if possible, be on the side of the room opposite to the fan, and as far from the latter as it can be got, in order that the fresh air may literally sweep the whole room before arriving at its exit—the fan. Having settled the inlet and outlet, the next consideration is what size fan to use. This is, of course, determined by the volume of air to be removed in a given time, or, as frequently stated, the number of times per hour the air of the room is to be changed. This is another pitfall for the ventilating engineer; for some rooms are sufficiently ventilated by a change once per hour, while others necessitate several changes per minute. The latter cases are not frequent, and may be left out of consideration at present.

Following is a table giving the approximate number of changes per hour for rooms ordinarily to be dealt with. It must, however, be understood that this table is only a rough guide or basis, and that each case has to be treated according to the special circumstances and environments:



Mechanical Ventilation.—Fig. 1.—Plan Showing Pipes in Roof and Elevation of Ventilator.

* Paper read at the annual meeting of the British Institution of Heating and Ventilating Engineers, London, England, January 28.

Table Showing the Number of Changes per Hour Usually Required for Satisfactorily Ventilating the Rooms Mentioned.

	Number of changes per hour.
Offices, warehouses, &c., according to number of occupants	2 to 4
Churches	3 to 5
Schools	6 to 10
Theatres	4 to 6
Hospitals, asylums, &c	4 to 6
Smoking rooms	6 to 10
Work rooms, &c	4 to 8
Factories, dusty processes	8 to 12
Hot engine houses, &c	12 to 60

From the foregoing table it will be gathered that the number of occupants in a room affects its requirements, and, in fact, in many instances, the air contents are neglected, and the number of occupants taken as the basis for calculation. This is very generally so in schools, asylums, hospitals, &c. Authorities differ considerably as to the quantity of fresh air required per person, some putting it as low as 2½ cubic feet per minute, while others allow as much as 50 cubic feet per minute.

In a paper on ventilation, recently read before the Incorporated Society of Medical Officers of Health, A. Wynter Blyth says: "The minimum of our requirements has long been known. Men like the late Ed. Parkes, De Chaumont and Douglas Galton have all agreed on standards of purity—as measured indirectly by the carbon dioxide—viz., that the air of living rooms should contain under 6 parts per 10,000 of carbon dioxide of animal origin, which means that each person must be supplied with 3000 cubic feet of good air per hour." This is 50 cubic feet per minute, but I am afraid it will be a long time before such a quantity is accepted as a standard.

In the State of Massachusetts the law regarding school ventilation is that each scholar shall be supplied with 30 cubic feet per minute, and a bill is being considered by the New York State Legislature requiring every public building and school house to have its air changed so as to provide each occupant with 15 cubic feet per minute. When will this country wake up to the necessity for such an enactment? I, personally, should be well satisfied with this 15 cubic feet as a standard, but few public buildings in this country are so well provided for.

As an example, take the class room of a school built according to our education department's schedule. For 60 pupils it would contain, say, 7200 cubic feet, and would have to have extracted from, and be supplied with, 60 × 15, or 900 cubic feet per minute. This means a change of air once in eight minute. On the Massachusetts requirements the change would be once in four minutes, or, acording to Mr. Blyth, once in 2.4 minutes. This latter would require an expenditure, both in initial cost and upkeep, that few people would care to entertain.

Taking, say, the 15 cubic feet per minute as our standard, and the room containing 7200 cubic feet as the one to be treated, we need a fan to give an output of 900 cubic feet per minute under working conditions.

Fan makers invariably state in their lists the duty of the fan in free air—*i. e.*, when doing no work beyond simply moving air through themselves—but immediately a fan is put to ventilate a room it has some resistance to overcome, and its output drops, so that an allowance has to be made for this, varying from 10 per cent. to, say, 30 per cent. in fans fixed without trunks, and to, say, 50 per cent. or more where trunks are used, even though these may be of fair size.

The fan and its position having been selected, as also the position of inlet or inlets—for it is generally desirable to have more than one, the total area being several times greater than that of the fan if possible—it only remains now to say that this incoming air must be warmed, and perhaps the simplest form of doing this is to place radiators in frout of the openings.

It must not be forgotten that these frequent changes of air will necessitate an increase of radiating surface over that required where no ventilation is adopted. Roughly this may be put at about 25 per cent. for each change. The committee rooms of the Houses of Parliament are a good example of the method described above. The average size of these rooms is 32 x 28 x 21 feet, containing, therefore, 18,816 cubic feet. They stand side by side, with windows on one long side, and doors opening onto a corridor on the other. The design of the windows will not permit the use of larger fans than 18 inches diameter, so two are being installed in each room (to change the air about once in seven minutes). They are arranged with sashes on the outside, hinged at the top to permit a free outlet, which at the same time form a sufficient weather protection, and close quite tight when the fans are not required. The sash is operated by a cord from below. The inlets are arranged on one side, and are connected to a duct below, from which a supply of fresh air, warmed in winter, is obtained.

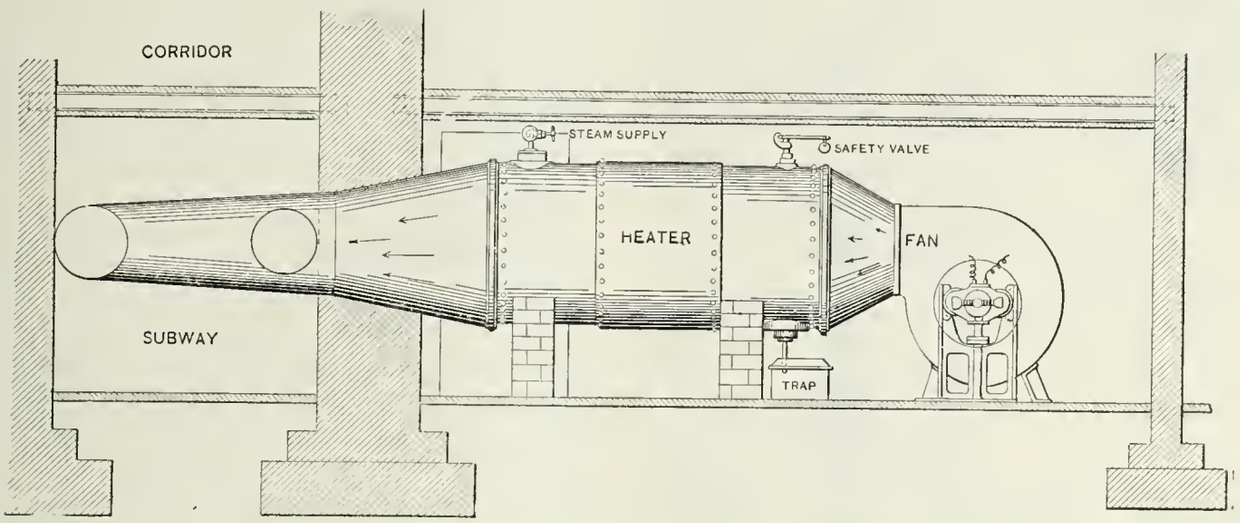


Fig. 2.—Elevation Showing Fan and Heating Chamber.

ROOMS TO BE VENTILATED COLLECTIVELY.

It frequently happens that the conditions assumed in the previous examples are not present or attainable. There may be a convenient situation for the fan, but no place for inlets, other than on the same side, which is useless, unless the air can be conveyed in trunks to the opposite side. Or there may be a good place for inlets, but none satisfactory as an outlet. Again, it may be objectionable, from an architectural or decorative point of view, to have fans showing in an open room at all. And further, in large buildings containing a good number of rooms, the multiplication of fans would mean not only a big initial expense, but a considerable item for attention and maintenance afterward.

In such cases it is generally found desirable to connect several rooms, by means of trunks, to one common center, and place the fan there. This is not always easy in the case of existing buildings, due to the difficulty of placing the trunks where they will not be unsightly, but it has frequently been done. In new buildings, however, trunks can be run between the floors, in the walls, &c.

Air propellers or open fans may be used in these cases, but the objections to their adoption are the loss of efficiency and large trunks required.

It is usually much better to install centrifugal or blower type fans of the single inlet pattern. Trunks may then be reduced to about one-fourth the area required for use with air propellers for the same output. A little more power is required when doing the work with blowers, but the other advantages more than compensate for this. The location of these blowers may be in the roof space, down in the basement, or any other convenient spot. In the case of a large hotel in Leeds just being fitted, the blowers are to go on the roof flats, being, of course, suitably protected there against the weather.

It is better to place the fans above than below, for in

the event of anything happening to them the ventilation, reduced in quantity, goes on automatically.

The size of trunks is an important point, and requires some care in calculation. Our method is as follows: Determine the volume of air to be removed from each room, and figure it on the plan. Total up the amount to be dealt with by one blower, and select one capable of doing that amount, under working conditions, not forgetting the loss to be allowed for. With this type of fan and properly proportioned trunks the loss is about 25 per cent. Ascertain the area of inlet to the blower, and divide this area into the rooms to be ventilated, in the proportion of the air to be removed from each. This will give the area of the branch pipe from each, and the mains must increase in size as the branches feed into them. But this is not the final calculation. Air in traveling through trunks has to overcome friction, and this is very marked in small sizes. It must be provided for by increasing the size. To be exact an algebraic formula would be needed, but for general purposes it is sufficient to add about 10 per cent. on the area for sizes 18 to 9 inches in diameter, and 20 per cent. down to 3 inches in diameter. It is not wise to get below that size.

Many rooms of which it has been said it was impossible to ventilate have been most satisfactorily treated by the use of these blowers, and in our own practice they are taking the place of air propellers for many purposes.

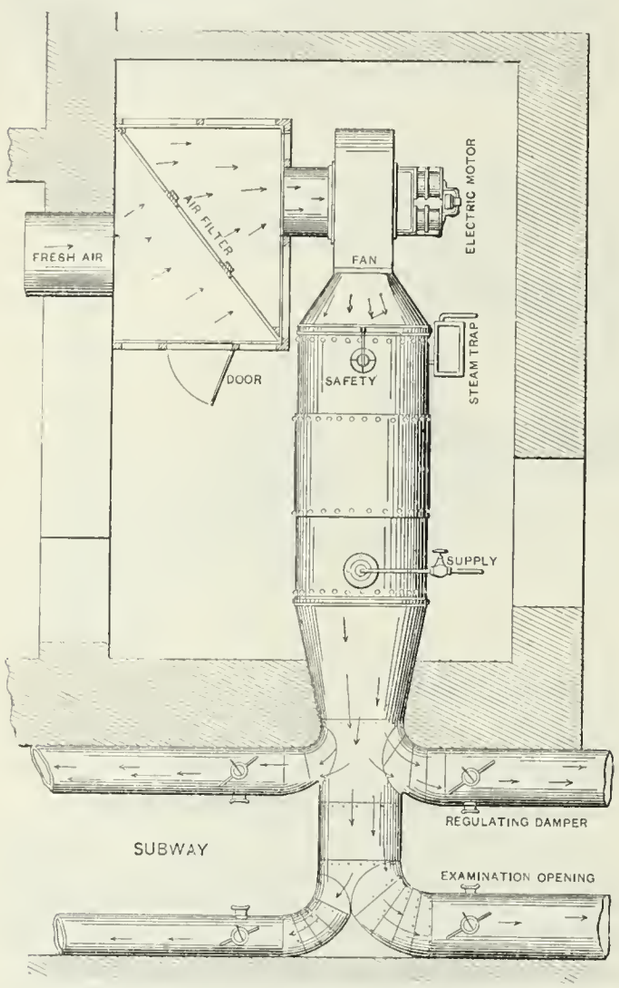


Fig. 3.—Plan Showing Fan and Heating Chamber.

At the new Patent Office Library in Southampton Buildings, Chancery Lane, four No. 5 electric blowers are fixed in the roof space. This is a large building, four or five stories high, but open in the center from ground floor to roof. The floors consist of galleries, running round the building, upon which are the book racks. Radiators stand against the walls, round each gallery, and behind them are air grids. The vitiated air extracted by the fans is replaced by fresh air through these grids, this air being warmed in winter in its passage through the radiators.

Another installation illustrating the application to a single room (in this case an engine and dynamo room) is at the Holborn Restaurant. This room is in the center of the building, in the basement, quite surrounded by other rooms. Here a No. 8 blower, with steam engine combined, is installed. It would have been quite impracticable to have attained to the desired result with an air propeller.

In this, as in ventilation by extraction, both air propellers and centrifugal fans are used, but as my experience has been mainly with the latter, I propose to deal with this plan only.

The arrangement of the blower and trunks is much the same as that last described, but is reversed. The blower must be placed in as central a situation as possible, and in the basement, if there is one. Main trunks are carried horizontally from its delivery in as straight a course as possible to the extremities of the building. From these branch trunks convey the air to vertical ducts in the walls, or tobin tubes on the wall faces, which ducts or tobins carry the air to the several rooms to be ventilated. The method of calculating the proportions of trunks is the same as for extraction. In determining the size of the blower, however, another factor has usually to be taken into consideration. If the scheme were one for ventilation only, the allowance for loss in friction, as mentioned for extraction, would suffice, but a plenum system without heating arrangements would be a failure, and in passing the air through a heater the fan duty falls considerably. It is wise in this case to allow for a loss of 50 per cent. from the free air figures of a makers' list—that is, if 10,000 cubic feet are required by the occupants of a building under consideration a fan listed to give an output of 20,000 cubic feet should be selected.

The warming of a building so ventilated is usually accomplished by placing a heater near the fan, arranged so that the latter either draws its air through the heater or forces it through prior to its entrance into the main trunk or duct. Various kinds of heaters are used. That most in favor in the United States appears to be one constructed of 1-inch wrought iron pipe. Another is the cast iron indirect radiator in its several forms. Cast iron gilled pipes have also been used, and in our practice we have installed a number of wrought iron tubular heaters, with tubes 3 inches in diameter, through which the air passes. Steam is the almost universally adopted heating medium, though many hot water installations have been made.

One important feature of a plenum scheme is the ease with which the air can be purified before being passed through the trunks and into the rooms. A screen is generally inserted at a convenient point between the fresh air inlet and the fan. It may be of coke, held in a wire work frame, or matting, or horse hair, or muslin, &c. It should be so arranged that water may flow over it, and should also be accessible or detachable for cleaning purposes. It must also be of ample size, so that the full volume of air may slowly but surely pass through it, or even 50 per cent. loss will not be enough to allow.

There has yet to be mentioned some detail of the arrangements for the air entering the rooms. The usual plan is to fix louvered air grids at a hight of about 7 feet from the floor, and thus avoid all possibility of the air current being felt by the occupants. This must also be provided against by keeping the velocity of the entering air low. Five feet per second is the usually accepted standard, but I have known cases where 10 feet per second was adopted with complete success. The movement of air at a quicker rate than 5 feet per second is perceptible, but it must be remembered that air entering a room though a grating immediately spreads, and thus loses its velocity.

For the same reason that inlets must be provided in a vacuum scheme of ventilation, outlets must be provided in a plenum system. Where these should be placed, however, authorities are at variance. One says put them near the floor, immediately under the inlet, and make the air travel horizontally across the room, down the wall and back along the floor, almost to the starting point. This sounds well in theory, but air is not so tractable as that at low velocities.

Another says, place the outlet near the floor, on the opposite side of the room to the inlet, because carbon dioxide is heavy and falls, forgetful of the fact that when exhaled by the lungs it is warm, and consequently lighter than the atmosphere, and therefore tends to rise.

Still others advocate the outlets being placed at the ceiling level, opposite the inlets. My own preference is for a combination of the two latter plans—viz., outlets near the floor and ceiling as well, on the opposite side to the inlets, so arranged that either can be used at pleasure, or both in conjunction if desired. The size should be slightly less than the inlets, so as to produce a pressure in the room slightly above that of the atmosphere, and thus prevent inward drafts from doors, &c.

Perhaps a description of an installation on the above lines, which we made at the Antrim County Asylum (Figs. 1, 2 and 3), will enable me to make clearer the general principles already stated.

The architects stipulated for a change of air four times per hour in the hospital blocks and three times per hour in the chronic blocks and dining and recreation halls, the temperature throughout to be 60 degrees F. when 30 degrees outside.

The buildings consist of the executive block (including dining and recreation halls), centrally located. Two

hospital blocks, two chronic blocks (one each for male and female in both cases), with workshops, laundry, boiler house, engine and dynamo rooms, &c.

A main corridor connects all the buildings, and under this is a subway, averaging 6 feet high and 6 feet wide. Branch subways go under each block, and these main and branch subways are utilized for steam, water and air pipes, as well as electric cables, &c. Seven electric blowers are installed, there being one for the central executive block, one for each of the two chronic blocks and two each for the two hospitals. They are all alike in size, having 24 inches diameter inlets, and equivalent area outlets. They run at 380 revolutions per minute, and deliver into the rooms from 6000 to 6500 cubic feet per minute. Their free air output is 11,400 cubic feet per minute. Each motor takes 1400 watts per hour.

In order to obtain the purest air possible, a turret is built in the center of the space between each of the buildings, and from the base of these turrets tile pipes, of 30 inches diameter, convey the air to the fans. Before entering the fans, however, the air passes through screens, made of woven horse hair, over which flows a gentle stream of water, and these abstract the particles of dust, carbon, &c., with which the air may have been charged up to this point. In addition, a little humidity is imparted, which is very beneficial in dry weather. The air is then passed through steam heaters, each of which consists of a wrought iron cylindrical shell, being 8 feet long, 3 feet 6 inches in diameter, and containing 93 3-inch tubes. The tubes are expanded into end plates as in a locomotive boiler, the air passing through them, and steam outside and within the shell. The steam pressure carried is 30 pounds per square inch. Each heater is trapped, and the condensation turned into return pipes, which empty into a tank near the boiler house. From there it is pumped back into the boilers. From each heater, galvanized sheet iron tubes, placed at the ceiling of the subways, carry the air to all parts of the building. It was originally intended that the air should be carried from these tubes, up the walls, in tile pipes, and in some cases that has been done, but in others the buildings had progressed too far before the ventilating scheme was settled, and so the alternative of rectangular tubes on the face of the walls was adopted. These tubes or tile flues, as the case may be, terminate in the rooms in louvered gratings, actuated by loose square keys which are carried by the attendants. Small rooms have one outlet only, but the larger ones have several.

It is interesting to note the air velocities in this scheme. At the fans, and throughout the main trunks in the subways, it is 27 feet per second. As each branch leaves the main a damper is fitted, which reduces the velocity to about 20 feet per second. The vertical ducts are enlarged again to reduce the velocity to about 10 feet per second; and the louvered gratings are large enough, and so constructed, that the air issues into the room at 5 feet per second. A considerable saving in trunks is thus effected.

Another useful purpose served by the dampers mentioned in the last paragraph is that they enable the whole air supply to be fully regulated and properly distributed. If one branch is getting too much, it can be checked in favor of another which may not be getting quite enough.

The temperature of the air entering the rooms in winter averages about 110 degrees F., but tested in any part of the room other than within a few feet of the inlets it registers 60 degrees when 30 degrees outside.

At the foot of each vertical duct, at every bend, and at numerous points in the straight lengths examination openings are fitted, permitting cleaning to be done if required; but so far this has not been needed, due doubtless in some part to the high velocity of the air.

Vitiated air outlets are arranged in all the rooms, to extract the air at the floor or ceiling level as desired or partially at both, a lever actuated by a loose key, working both outlets at once, opening one when closing the other. Tile flues or sheet iron tubes, as in the case of the inlets, convey the air up the walls to main extraction trunks in the roof spaces, and these terminate in ornamental turrets on the roofs.

As to cost, the contract was a little over £4000, which for 400 patients, plus attendants, makes the amount about £10 per head, for the complete system of heating and ventilation, exclusive of boilers, which were in another contract.

The upkeep and cost of working the system is difficult to ascertain, seeing that the same boilers supply kitchen, laundry, hot water service, &c., but a timed test was made of the condensation of the heaters, and this gave 2500 pounds of steam per hour. Calculating on this basis, and that there would be 2691 hours per year requiring heat, we estimate the coal consumption to be 500 tons per year, which at 10 shillings per ton equals £250. Seven blowers, taking 1400 watts each per 3588 hours per year (in suitable weather the fans are stopped and all windows opened), would mean 35,162 units, which at, say, 1 penny per unit, would amount to £146 10s. 2d. for the year. Putting the two together and adding for attendance, incidentals, &c., £104, makes an amount of £500, which is 25 shillings per patient per annum.

ASSOCIATION NEWS.

Ohio Master Plumbers.

The annual meeting of the Ohio State Association of Master Plumbers was opened at 10 o'clock on Tuesday morning, February 11, in the Army and Navy Hall, at Cleveland, Ohio, by President Rolla B. Moodie of Dayton, with a large attendance. The principal theme of discussion was trade protection. An effort is being made to strengthen the association along these lines, and it is reported that the manufacturers and dealers in plumbing supplies are to be asked to refuse to sell material to plumbers who are not members of the association. At the close of the convention Dayton was selected as the place for holding the next meeting, and the following officers were elected for the ensuing year:

President, Eb. Ellen, Cleveland.
Vice-President, A. S. W. Hoffman, Columbus.
Secretary and Treasurer, John Leese, Cleveland.

The name of John L. Riley of Dayton was unanimously selected to be recommended to the National Association for appointment as National State Vice-President for Ohio. On Tuesday night a banquet was tendered to the delegates at the Forest House, at which 275 covers were laid, after which the delegates attended the Empire Theatre in a body. After the theatre a lunch was served in the association rooms in the Chamber of Commerce Building.

Buffalo Master Plumbers.

At the annual meeting of the Master Plumbers' Association of Buffalo, N. Y., held last week, the following officers were elected for the ensuing year:

President, Frank L. Beyer.
Vice-President, Daniel Lund.
Treasurer, Albert J. Batt.
Secretary, John J. Kavany.
Board of Trustees: Charles Geiger, Joseph S. Stygall, Samuel B. Stewart, William H. Martin, John J. Kavany.
Sergeant-at-Arms, Edward P. Franke.

Massachusetts Master Plumbers.

The regular quarterly meeting of the Massachusetts State Association of Master Plumbers was held at Boston last week with the different parts of the State well represented. The official reports showed an increase in membership during the year, the result of the work of Organizing Clerk C. C. Brown. The Cleveland resolution was discussed favorably. After the meeting a dinner was given to the delegates.

Iowa Master Plumbers.

The fifteenth annual convention of the Iowa State Association of Master Plumbers was held at Davenport, Iowa, on February 12. The principal feature of the meeting was the consideration given to the Cleveland Resolutions, which were indorsed. The following officers were elected for the ensuing year:

President, A. H. Walker, Des Moines.
Vice-President, J. L. McCarthy, Clinton.
Secretary, H. W. Noble, Sioux City.
Delegates to National Convention: Robert Clayton, Davenport; John McDermott, Dubuque.

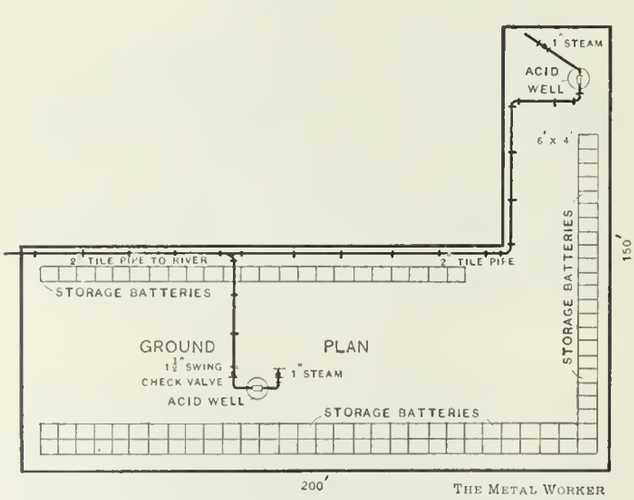
The smaller factory of the Red Wing Sewer Pipe Company, Red Wing, Minn., which was totally destroyed by fire recently, will be rebuilt at once. The loss was fully covered by insurance, which has been adjusted, and a large force of men are now cleaning up the plant. The company advise us that they cannot tell as yet whether the power plant has been destroyed, but the probabilities are that it will be reinstalled, after being rebuilt.

AN ACID WELL EJECTOR.

BY D. F. N.

In one of the large electrical power plants on the river front in New York vaults were built under the sidewalks on one street 200 feet long and about 150 feet long on the avenue, as shown by the plan given in Fig. 1. In these vaults are 350 small tanks for storing electricity, their dimensions being 6 x 4 x 2 feet each. The tanks are lined with 8-pound sheet lead, the seams in the lining being made tight by lead burning, so as to withstand the corrosive effect of the strong acid solution. Under these tanks there is an accumulation of waste water and surplus acid, which finds its way to the center of the concrete floors on the street side and on the avenue side, where there are circular wells 4 feet in depth and 3 feet in diameter. The floors have a pitch to the center, where the wells are located. The floor of the vault being below the level of high tide in the river, the salt water oozes through the walls. The disposition of this water and of the acidulated water from the tanks has been a cause of considerable annoyance. The task of overcoming the difficulty was placed upon the steam fitter in the employ of the company, who was ordered to make an ejector to empty the water out of the wells each time they became filled. The porter in the basement, in connection with his other duties, was in charge of the wells. Ejectors were built from 1½-inch iron pipe with proper steam jet and strainer, and obtaining power from 1-inch steam connections. They seemed to do the work fairly well for about a week or so, after which they were found to act improperly. They were replaced with iron pipe, with a recurrence of the same result in a short time.

The plumber was then called upon to try and remedy the evil. He disconnected the iron pipe in the well, and found it eaten away in several places at the threads which lay in the bottom of the well. After removing the iron pipe ejector he set to work to overcome the trouble by introducing ejectors made of lead as substitutes for those made of iron. In construction, the lead ejectors had to be made so as to be thoroughly accessible for cleaning purposes. In making the ejector an extra heavy cast lead tee 10 inches long and 5 inches in diameter had to be molded, with a jet within the center of the casting tapered to the edge of the suction chamber inlet, the end of the jet having a ¼-inch bore on the inner



An Acid Well Ejector.—Fig. 1.—Plan, Showing Location of Ejectors.

side and 1-inch on the outer side, as shown in Fig. 2. One end of the tee for the discharge pipe had to have a standard thread 1½ inches deep into the inner opening. This thread was cut on a lathe. A piece of 1½-inch 3/A lead pipe, 5 feet long, was next taken in hand and beaten down to the size of 1¼-inch 3/A lead pipe for a space of about 4 inches from the end. This pipe was also placed on the lathe and threaded 2 inches long to fit snugly into the thread in the tee. The same work was performed on the end of another piece of pipe to receive the steam, excepting that the pipe was 1-inch beaten down for a ¾-inch thread. The branch end of the tee for the suction pipe and strainer was increased in size to receive 2-inch 3/A lead pipe and beaten down to 1½-inch pipe size for a space of 4 inches from one end. The other end was beaten up to close the pipe tight, forming a half globe at the extreme end. This piece of pipe was 11 inches long, and had five rows of ⅜-inch holes drilled out clean on the length to make a strainer. In making up the joints it was found necessary to cover the threads with plumbago, as the lead to lead connection had a tendency to stick on the pipe entering into the tee. The upper ends of the 1-inch and 1½-inch lead pipes

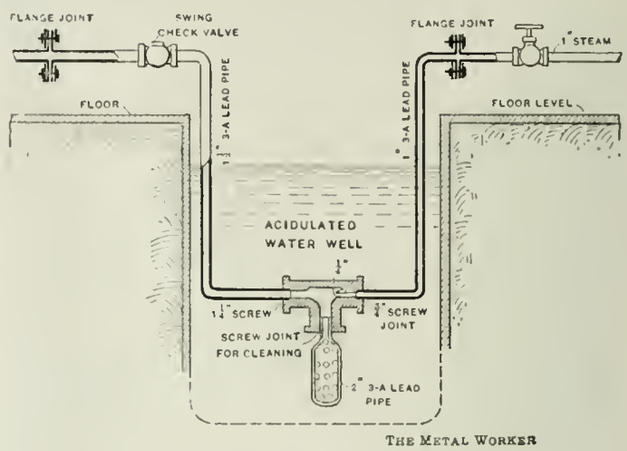


Fig. 2.—Elevation of Ejector and Connections.

had heavy brass collars slipped over them. Then the lead was beaten out to form a flange, and a union was made by means of bolts through the two brass collars. One of the brass collars on the steam end was threaded on the inside to receive the iron pipe. These ejectors have been in operation for some time, and are doing the work required successfully.

The Public Comfort Question.

The following pertinent article by Joseph A. Lord of New York, which will apply to most of the large American cities, is reprinted from the New York *Times:*

Scene: New York City. Time: 1902. Mr. Primrose suddenly finds himself forced by nature to seek a retiring place, enters one of the shops in the vicinity, and is very courteously directed to the *café* on the corner.

After some hesitation, he decides to act upon the information, although he is at home an advocate of prohibition. He is both surprised and pleased to find a well appointed, properly ventilated toilet room, with wash basins, hot and cold water, towels, soap, &c. As the *café* proprietor is not in business for his health, he expects that those who patronize the sanitary department will do likewise at the *café* end. Mr. Primrose, however, being a man of mind and opinions, goes away without doing the latter.

Michael Monnihan is at work on a building in the course of erection. Having a call of the same nature he finds himself between two fires, as it were. A nuisance committed in the building will result in his discharge, if detected. If he leaves the building during working hours he will be discharged. In the ordinary flat buildings contractors rarely make provision for the men. In the large skyscrapers a trough affair, a very crude arrangement, is placed in the cellar, and soon becomes so foul that the average man either waits until noon or evening in preference to using it.

Another point: Imagine a man ten, fifteen, or even five stories up, starting for the cellar. The result is he goes to a saloon where he knows he will be clean and comfortable. Not being as strong minded, and possibly more fair minded, he shows his appreciation by patronizing the *café*.

Mrs. Primrose or Mrs. Monnihan, placed in the same position, is to be pitied, for unless they happen to be in the vicinity of one of the department stores, a foundation is laid for possible sickness.

Less talk about prohibition, Sunday closing, &c., and some practical attempt to remedy these conditions would render the task of the Sir Joseph Bowleys and other friends and fathers of the poor, yes, and the semi-poor, much easier, and I might add that it could be done on the same philanthropic per cent. basis that model tenements, coffee inns and other estimable projects are conducted. The few places now provided by the city are anything but inviting, and are not made use of by the average man for reasons that can easily be imagined.

I would be pleased to communicate with those who

are interested in this matter looking toward the formation of a committee to take up the question of bringing about a change, as space does not permit the publishing of many things I might discuss in connection with this subject. The many years' study of these conditions causes the belief that the majority of men receive their first introduction to the saloon through the reason above stated.

Some will say this is a delicate question for public discussion. Well, we must admit that a surgeon called to the scene of disaster does not ask those hurt many questions, but starts at once to put in shape broken bones, even though the victim does resent the seemingly rough treatment.

CONSOLIDATION IN THE RANGE BOILER INDUSTRY?

The Range Boiler Association have been holding meetings in New York City since Tuesday of this week, but up to the present no news of a definite character as to the result of their deliberations has reached the trade. The meeting on Tuesday was of a routine nature. Several of the members of the association have been accused of violating the rules, and the hearing of the arguments in these cases occupied the attention of the association during the whole of Wednesday. The discussion of these complaints was continued on Thursday. There is a feeling among the members of the association that more stringent methods of conducting the affairs of the association will have to be devised, in order to keep some of the weak kneed members in line.

There is a proposition before the association, whereby the various plants of the members are to be absorbed by one company, which will take over the manufacture and control the sales of the entire product in this country. What success the promoters of this scheme will meet with is very problematical. It is understood that this proposition has been made several times previously, but upon examination it was found that the promoters did not have the proper backing. The people who are behind the scheme this time, however, are said to be in a position to make a definite arrangement; consequently the scheme may meet with the favorable consideration of the members. It is claimed that this will be the only way of eliminating the trouble from the range boiler industry.

The New Eagle Pipe Wrench.

Since the introduction of the Stillson pipe wrench a number of years ago no radical improvement or change has been made in this style of tool. The design of the Stillson wrench was so perfect that it has been universally adopted throughout the world, and nearly every



The New Eagle Pipe Wrench.

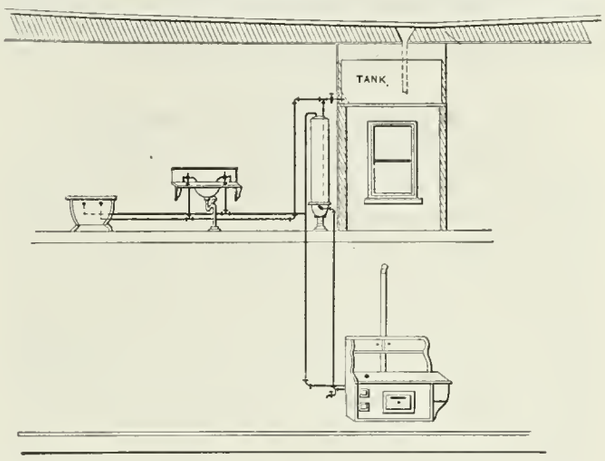
other wrench subsequently introduced has been more or less of a copy of the principal features of the Stillson construction. The new Eagle pipe wrench that is just being manufactured and placed on the market by the Frank Mossberg Company, Attleboro, Mass., an illustration of which is given herewith, is probably the first radical departure from the construction of the standard pipe wrench above referred to. The wrench derives its name from the peculiar shape of its jaws. It is simple in construction, and is said to work with absolute success. The tool adjusts itself instantly to any size of pipe or rod, from the largest to the smallest, and the harder the operator pulls on the handle the more firmly the jaws will grip the pipe, while a backward motion will instantly release the hold. In this respect it can be operated very much the same as a ratchet wrench. In designing this wrench the manufacturers had in view the production of a pipe wrench that should be quick and convenient to operate and which would have a firm grip without slipping, which objects they claim to have accomplished in a most satisfactory manner. The wrench is especially adapted for the use of gas and steam fitters, plumbers and machinists, as well as of all who have occasion to use such a tool. It is made from the best drop forgings of finely finished and well tempered steel.

COLD WATER FROM A HOT WATER FAUCET;

HOW IT WAS REMEDIED.

BY OLIVER TWIST.

The range boiler was full of hot water, but nothing but cold water could be got out of it at any of the fixtures. It is true that there was no fire in the range at the time; but, if the pressure be on the system and the boiler full of hot water, then of course it should be "on tap" at any hot water faucet. Fig. 1 shows how the boiler was connected, the system being supplied from a



Cold Water from Hot Water Faucet.—Fig. 1.—The Original Pipe Connections.

tank near the ceiling of the second floor of a dwelling having a flat roof, which is graded to a point immediately over the tank, into which the rain water is collected. This tank is placed just below the joists, a manhole being provided in the roof for cleaning and repairs. It is supported by partitions at both ends which form a nice litle room for the storage of linen, &c. The range boiler is located in the bathroom, which leaves more room in the kitchen, and also helps to heat the bathroom in the winter. It is supplied through a ¾-inch pipe, which also connects to the range, and from thence to the top of the boiler, the idea being to have a quick

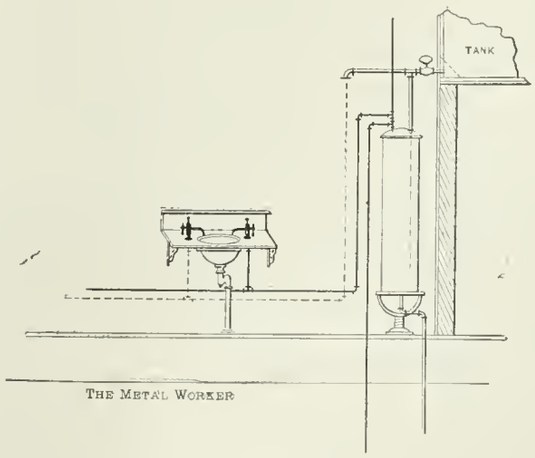


Fig. 2.—The Altered Piping.

heating system, so that hot water might be used at the fixtures a few moments after the fire is started. This, of course, could not be done if it was connected to the side of the boiler, as is usually the practice. The hot water supply to the fixtures was taken from a tee placed in the circulating pipe between the range and the boiler about 8 inches above the bathroom floor.

In Fig. 2 is shown how the trouble was overcome. The tee just mentioned was removed and a ½-inch pipe

was run directly to the top of the boiler, where it was connected to the side of a ¾ x ½ tee. A ⅜-inch pipe from the top of this tee was taken to the top of the tank for a relief pipe to the system. The dotted line in Fig. 2 is the cold water supply to the fixtures, with the exception of the water closet, which is supplied direct from the street pressure. A hose bib is placed at the lower tee near the range, which answers two purposes. The system may be emptied by it for repairs, and should the tank run dry in an unusually dry summer it may be refilled from the street pressure by means of a hose attached to the sink bib. A strainer should also be placed over the outlet of the tank, so that any danger from sediment blocking the pipes may be removed.

This method of using soft water for the range boiler has several advantages to recommend its use. It is economical, because water rates are reduced considerably, and the trouble so often met with on account of pipes being filled with lime is entirely removed, which every one will admit is a good feature. Hot water can now be obtained so long as there is any in the boiler, whether there is any fire on at the time or not.

The National Radiator Company.

The announcement is being sent to the trade by the National Radiator Company that they have succeeded to the entire business, good will and franchise of the Fowler Radiator & Mfg. Company of Johnstown, Pa., and have organized with Samuel B. Waters as president, and John H. Waters as secretary and treasurer. The announcement states that the company are now enlarging their plant and providing it with new equipment in order to fill promptly the increasing orders which the demand for their wall and regular styles of radiators is bringing to them. They also state that they are bringing out a number of new patterns of radiators, which will be presented in a new catalogue, which is now in course of preparation. The new company state that the goods produced by them will be of the same standard of excellence heretofore maintained by the old concern, and that their patrons will receive liberal treatment in all dealings.

Heating and Plumbing Notes.

Some time ago it was reported that an acetylene association, similar to that in existence in Germany, was to be organized in Great Britain, for the regulation of the acetylene trade. The movement, however, fell through at that time; but recent advices from London indicate that it has again been taken up, and that a definite formation of an acetylene association has taken place, with a full list of directors and officers, who are said to include men of importance in the industry, as well as of scientific prominence outside of the trade. The aim of the association is said to be for trade protection, and also for the advancement of acetylene engineering, and for the publication of information on this subject.

The Anderson Coupling Company, Portland, Conn., are sending to the trade a circular showing their patent Beer and Ale Tap Couplers. With these substantial and well finished brass fittings and the tools which they provide for connecting them with block tin and tin lined lead pipes any ingenious mechanic can make the connections with beer and ale barrels in a cellar and lead them to the faucets under bars on a floor above.

Thomas Scatchard died of paralysis on February 13, at his home at Little Falls, N. Y. For many years he conducted a large plumbing business in that city, but was compelled to retire on account of ill health four years ago. He was born in England about 50 years ago, and came to this country when quite young. He is survived by a wife and two children.

Under an order of Judge Halsey, the plumbing in the Court House at Milwaukee, Wis., has been subjected to a test, and has been found so bad that most of it will have to be taken out.

The Board of Examiners of Plumbers at Grand Rapids, Mich., have found it expedient to amend the rules and regulations governing the granting of licenses, so that now any person forming a new firm or joining an old one must qualify and secure a master plumbers' license.

The council of the village of Granby, near Montreal, Canada, has passed a by-law to be submitted to the ratepayers authorizing a loan of $15,000 to the Granby Supply Company for ten years without interest, and exemption from taxes for 20 years. The company, of whom Edward Bradford is the promoter, undertake to have an annual payroll of $15,000, and expect that it may be much larger than that sum.

Peter Adriance & Son are placing a steam heating plant in the residence of Samuel Thorn, at Poughkeepsie, N. Y.

The Argon Mfg. Company, Denver, Col., are sending to the trade a four-page circular devoted to the Argon Air Valve, which is said to work automatically on steam or hot water heating systems under all conditions. The Valve is of the float character, and is constructed so as to operate quickly.

John Beatty Gordon, a well-known master plumber of East End, Pittsburgh, Pa., died at his home, 525 Park avenue, on February 11, aged 40 years.

The Board of Education of South Bend, Ind., awarded the contract for heating the Oliver and Perley schools, in that city, to MacGinn, Bradley & Co. of Chicago, at their bid of $14,600.

The Penn Radiator Company, Corry, Pa., have completed arrangements to double the present capacity of their plant. Plans are ready for the new buildings, and they will be started as soon as the weather permits. This is the second time the company will have doubled their output since they were organized a year and a half ago, having finished putting up a new foundry, core room and cupola less than six months ago.

A card issued by the Estate of E. F. Keating, 452 Water street, New York, announces that Samuel G. McFarland, who has been prominently identified with the plumbing supply trade of New York City for many years, has become connected with the Keating establishment, and will hereafter represent it in the boroughs of Manhattan and the Bronx.

The Committee on Public Property, Newburyport, Mass., will receive bids until February 28 for heating and ventilating the Putnam School Building, in that city.

Libby & Blinn, Hartford, Conn., are installing a Cottage Boiler at Osborne Station, Newington, Conn.

J. L. Bixby, Jr., of the Bixby & Eddy Company, 215 Franklin street, Boston, Mass., dealers in Steam, Water and Gas Specialties, was a visitor at *The Metal Worker* office this week.

One of the largest warm air heating plants that has been installed in the West for some time was placed recently in a school building at Walla Walla, Wash., by W. G. McPherson of Portland, Ore. The building is two stories in hight, and is 30 x 50 feet in size, having eight rooms. It is heated by four 60-inch casing furnaces set in brick. The outflow of foul air is produced by means of four stack heaters, the air in each room being changed five times per hour. The system has been subjected to test, and is said to heat and ventilate the building perfectly in the coldest weather, reflecting great credit on Mr. McPherson, who designed and installed the plant.

Barlow Brothers, Waterbury, Conn., are busy with a number of plumbing contracts, and are installing an automatic sprinkler system for the Waterbury "American."

Joseph Zane, one of the pioneers in the plumbing business in Boston, Mass., died at his residence, in that city, on February 14, aged 85 years. He was born in Baltimore, Md., and there learned the plumbing trade, after which he worked in New York, making the acquaintance of P. T. Barnum. He afterward did business in Bridgeport, Conn. Later, on the advice of Mr. Barnum, he went to Boston, where he had been in business for half a century. Mr. Zane was widely known as the inventor of the Zane Water Closet and a number of other plumbing specialties. He is survived by his wife.

The Federal Boiler & Supply Company have

opened offices in the Federal Building, 88 and 90 Centre street, New York, in charge of E. E. Baker and A. E. Pfahler, where their varied lines of Boilers and Radiators and a full line of Steam Fitters' Supplies and Specialties can be supplied.

C. V. KELLOGG has moved his office in New York to the Federal Building, 88 and 90 Centre street, where he has a fine suite of rooms.

MAYOR KNIGHT of Buffalo, N. Y., has appointed Frank L. Beyer a member of the Examining and Supervising Board of Plumbing.

A HOT BLAST heating system has been installed in the City Hall of San Francisco, Cal., which is claimed to be the largest plant of the kind in the world, being designed to furnish 10,000,000 cubic feet of air per hour. A 14-foot fan is used, driven by a 45 horse-power engine.

THE Board of Public Improvements of St. Louis, Mo., has approved the sewerage system of that city submitted by Sewer Commissioner Hermann. When completed, this will increase the demand for the services of the local plumbers.

A BILL to compel gas companies to place on all gas meters automatic valves to prevent the escape of gas in case of fires has been favorably reported to the New York State Legislature.

AUGUST GEIGER, Philadelphia, Pa., will install a low pressure steam heating plant at 310-312 Vine street, in that city.

New Firms and Changes.

THE BICKFORD HEATING & ENGINEERING COMPANY have been incorporated at Tiffin, Ohio, with a capital of $25,000.

C. G. KUNNEEN, who has been traveling for Fairbanks, Morse & Co. of Chicago for several years, has resigned his position and entered into partnership with Barnett & Richards, on West Bridge street, Grand Rapids, Mich. The new firm will be known as Barnett, Richards & Kunneen.

THE THERMOGRADE VALVE COMPANY have been incorporated at Syracuse, N. Y., with a capital of $10,000 by Hiram Thompson, E. L. Chaney and Joseph L. Brindley to manufacture Steam Valves, Traps and Heat Controllers.

THE ALDENS PLUMBING & HEATING COMPANY, 48 Bloomfield avenue, Passaic, N. J., have been incorporated, with a capital of $10,000, by Levi Aldens, George S. Aldens and Charles E. Aldens, to do a plumbing and heating business.

A Threatened Famine in Foundry Iron?

There are indications of a buyers' scare in foundry pig iron, since apparently some consumers, large and small, are ordering iron in excess of their usual requirements, having grown nervous over the possibility that their raw material may not reach them in the quantities and at the times desired. During December, in particular, and in January, to some extent, production and deliveries were seriously interfered with, the former by a scarcity of coke and the latter by the prevailing troubles in transportation. Quite recently these distributing influences have again made themselves felt, and apparently have contributed to emphasizing the danger.

While these troubles eloquently prove how enormous is the consumption, and how closely, with the light stocks in furnace yards, we are sailing to the wind as to supply, they do not necessarily foreshadow an actual famine. With the coming of spring we may expect that the railroads will be able to do justice to the demands of the iron industry for prompt conveyance of raw materials and of products.

Production is not only likely to be less hampered in the future, but is expected to expand quite considerably. During the next few months a number of furnaces are to resume, after an idleness more or less prolonged. Among these are, in the South, Trussville, which has just started; Lady Ensley, which is to go in in April; the second Woodward, probably in the same month; Talladega and Allegheny af an early date, and No. 2 Sloss, remodeled and enlarged, in April or in May. Max Meadows in Virginia, has just blown in, Gem in Virginia and the second Middlesbrough in Kentucky will probably produce in April. A large new producer, the fine new furnace of the Republic Company, in the Birmingham district, will be added to the ranks in March.

In the East we have Durham, Pequest, Allentown, one Brooke and later on Cedar Point, which will all contribute their quota.

From the Central West, on the other hand, come reports that several furnaces are to swing off from foundry to basic or Bessemer iron, and it is this fact which has created some uneasiness. But it is in this great region that we may most expect an improvement in the production of the plants which have suffered most from the coke and car embargo.

The Southern producers, of course, are the largest single factor in the foundry trade, since they make nearly one-half of the entire product of the country. Their position is well illustrated by that of the eight leading interests in Alabama, Tennessee and Virginia. We understand that these concerns have in the aggregate on their books orders for 700,000 tons of foundry pig iron scattered for delivery during the year, the bulk of course for the first half. They do, however, run to the end of the year. The same furnace interests have unsold a capacity of 700,000 tons of pig iron for the balance of the year, so that, so far as the principal source of foundry iron is concerned, there is a large tonnage still available.

Unfortunately data are not available for the other producing sections, but with such a reserve it seems somewhat hasty to conclude that there will not be pig iron enough to go around.

There remains one point to which attention should be called, and that is the possibility of importations of foreign pig iron, should prices be advanced unduly by a buyers' stampede. That this is not so remote is proven by the fact that to-day 5000 tons of No. 3 Middlesbrough foundry pig iron was purchased for importation.

It must not be forgotten either that the second half of the year will bring into the market a number of new blast furnaces. It is true that the greater number of them, either the three stacks at Clairton, Pa.; the two furnaces of the Lackawanna Company, removed from Scranton to Buffalo; the two Colorado furnaces, the new La Belle and others will serve the steel trade. But they will relieve the situation in that direction and will thus favorably influence matters in the foundry iron trade proper.—*The Iron Age.*

A Solar Motor.

From an engineering point of view, says A. G. Miner in *Shop Talk*, the solar motor erected at the ostrich farm at South Pasadena, Cal., is of quite an interest. This means of utilizing the heat energy which comes from the sun is the outcome of many investigations and experiments in that line and is only one of the various means that have long been experimented with to utilize the earth's natural forces. Tidal machinery is another one of these power developing ideas. Properly utilized this form of motor should serve to somewhat allay the fears of those who predict the exhaustion of the world's coal supply and the subsequent end of the world.

The reflector is in the shape of a huge open umbrella, 32 feet in diameter. The parabolic reflecting surface, 640 square feet, is always automatically turned toward the sun by means of clock work, so that the rays are focussed in rings on the central tube or boiler, which takes the place of the stick in the umbrella. The boiler is a tubular one holding about 100 gallons of water. At a test, 192 pounds of water per hour was evaporated, forming steam of 150 pounds pressure. The boiler is used to supply steam for pumping water, for irrigating purposes, and at this test the pumps delivered 1400 gallons of water per minute against a head of 12 feet.

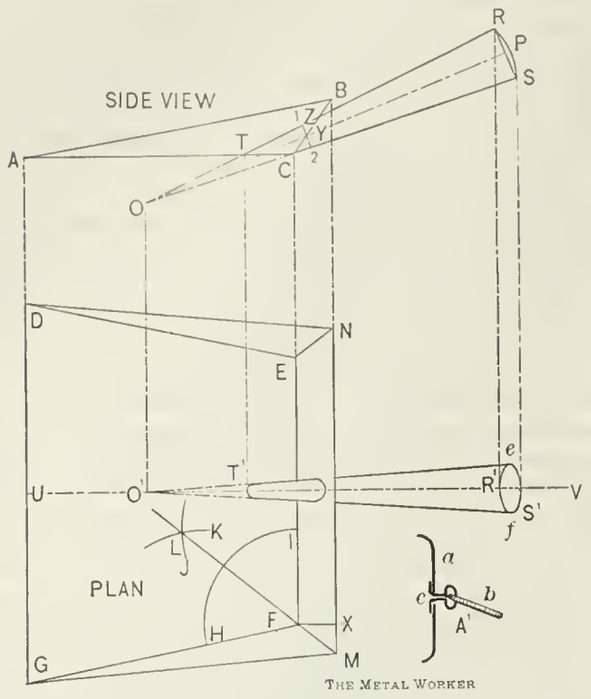
Naturally, the efficiency of the motor is decreased in the absence of direct sunshine, but it generates steam nevertheless, and is located in a country where the sun is to be depended upon. It is rated at about 15 horsepower and cost approximately $2500.

PATTERN FOR A DUST PAN

Without Allowance for Lap.

A square cornered dust pan is a simple article that can be made in any shop out of IX tin. The method for cutting the patterns is not difficult.

In Fig. 1 let A B C represent the side of the pan, and D E F G the view of the bottom on the line A C in side view. It is now necessary to obtain the miter line of the



Pattern for a Dust Pan.—Fig. 1.—Plan and Side View.

corners in the plan. With F in the plan as a center, describe the arc H I, so as to intersect the sides of the pan G F at H and F E at I. Then with H and I as centers, and with any convenient radius, describe the arcs K and J respectively, intersecting each other at L. Then through L and F draw a line, extending it outward toward M. Intersect this by a line projected from the point B in side view. From M draw a line to G, thus completing the side of the pan in plan, as shown by G F M. In similar manner draw the opposite side D E N.

In the side view draw O P, the center line of the

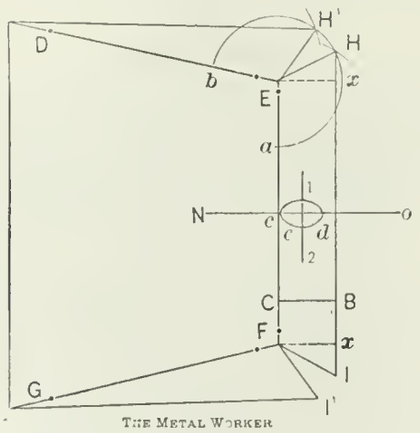


Fig. 2.—Pattern for Pan.

handle, so as to intersect the bottom of the pan and also the back at Y. At right angles to O P draw the line R S of the proper dimensions, and from R and S draw lines to the center O intersecting the back and bottom of pan at Z and T and the bottom at C respectively. To obtain a view of the handle in plan, which, however, is not necessary in the development of the pattern, proceed as follows: Through the center of the pan draw the line U V, then from the points O, T, R and S in side view drop lines intersecting the center line in plan at O¹, T¹, R¹ and S¹. Now take the distance from P to R in side view, and place it in plan, as shown on either side of the center line by *e* and *f*, and from these points draw lines to the center point O¹. The solid lines shown give the plan view of the handle.

For the pattern for the pan take a tracing of D E F G and place it as shown by D E F G in Fig. 2. Now take the distance from C to B in side view in Fig. 1 and place it as shown at right angles to E F in Fig. 2 by C B. Through B parallel to E F draw the line H I. At right angles to E F and from points E and F draw the lines E *x* and F *x*. Now take the distance from X to M in plan in Fig. 1 and place it as shown from *x* to H and *x* to I in Fig. 2, and draw lines from H to E and I to F. Now with E as center and E H as radius describe the arc *a b*. Now with *a* H as radius and *b* as center intersect the arc *a b* at H¹. Draw lines from E to H¹ to D. Trace similar miter on the opposite side, as shown by F I¹ G. Then will D H¹ E H I F I¹ G be the pattern for the pan.

Referring to the side view in Fig. 1, it will be noticed that the handle passes through the back of the pan and is soldered to the bottom at T C. For the opening to be cut into the back of the pan proceed as follows. Bisect the line E F in Fig. 2 by N *o*, then take the distance from C to Z in side view in Fig. 1 and place it as shown on the line N *o* in Fig. 2, from *c* to *d*. Bisect *c d* and obtain the point *e*, through which at right angles to *c d* draw 1

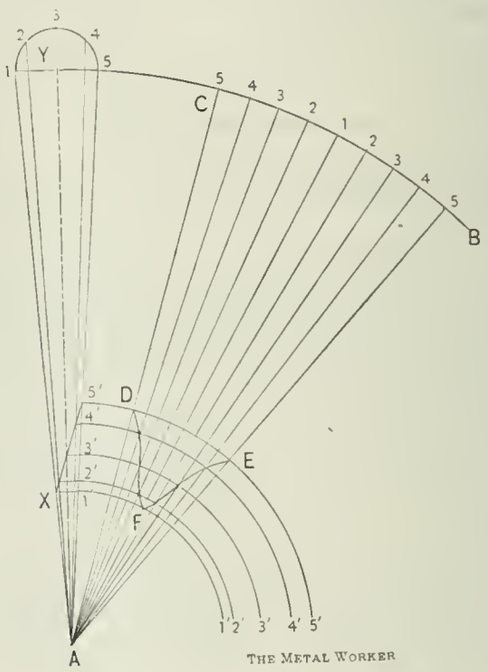


Fig. 3.—Pattern for Handle Enlarged.

2 indefinitely, as shown. Now at right angles to O P in side view in Fig. 1 and through the intersection Y draw a line intersecting the sides of the handle at 1 and 2. Now take the distance from Y to 1 or 2 and place it in Fig. 2 from *e* to 1 and *e* to 2. Through 1 *d* 2 *c* draw the ellipse, through which the handle will pass.

In Fig. 3 is shown the method of obtaining the pattern for the handle, which has been drawn on a slightly enlarged scale to better show the principle. Let A 5′ 5 1 *x* be a reproduction enlarged of O C S R T in side view in Fig. 1. Place the semicircle 1 3 5 at the end of the handle in Fig. 3, which divide into equal spaces, as shown by the small figures 1 to 5. From these points at right angles to 1 5 drop lines intersecting the base line 1 5, as shown. From these intersections draw lines to the apex A intersecting the line X 5′, as shown. From these intersections at right angles to the center line 3 A draw lines intersecting the side of the handle 5 A at 1′ to 5′, as shown. Now with A as a center and radii equal to A 5, A 5′, A 4′, A 3′, A 2′ and A 1′ draw arcs, as shown. Draw any radial line, as C A. From C on the arc C B step off twice the number of spaces shown in the semicircle Y, as shown by the small figures 5 to 1 to 5 on C B. From these points draw lines to the center A intersecting arcs having similar numbers, as shown. Trace a line through these intersections, as shown by D F E. Then will C B E F D be the pattern for the handle.

P in Fig. 1 shows a button on the handle slightly

raised, on which a wire riug can be fastened to hang up. The wire ring can be fastened as shown in diagram A¹, Fig. 1, in which *a* is the raised button, *b* the wire ring, around which a strip ¼ inch wide, shown by *c*, is fastened. A slit ¼ iueh wide is eut into the button with a small ehisel, the strip passed through and turned over, as at *c*, whieh completes the pan.

The corners can be double seamed, and the edge wired or a hem edge put on, if so desired.

Stove Pipe Statistics.

Some curious statisties on the amouut of human energy expended in the manufaeture of stove pipe were recently given to a representative of the *Press* of Carthage, Mo., by Frank Stephens, an expert sheet metal worker in the employ of Keim & McMillan of that eity. "Few realize," said he, "the amount of work required to make one joint of stove pipe. I have figured the amount out about this way:

"The first thing the sheet iron is unloaded ou our back walk, put on the elevator, hoisted to the third floor, unpaeked and put on the cutting bench. Then it requires two motions of the feet and four more of the arms to cnt each joint, four motions of the arms to edge, eight revolutions of the erank to form it, four of the arms to feed the rollers, six motions to operate the grooving maehine, four motions of the arms and six strokes of the hammer to rivet it; four motions of the arms and four revolutions of the erimper erank, six more to join two joints together (to see if they will fit) aud four more motions to pnt them on the shelf.

"Thus there are 56 motions required for eaeh and every joint. Our yearly output for eaeh fall is about 20,000 joints, which represents 1,120,000 motions of the human body. A joint of 6-inch pipe is 20 ineches wide, 24 inches long and contains 280 square ineches, eonsequently the output of 20,000 joints requires 5,600,000 square inches of steel surfaee."

The Sparse Distribution of Tin.

A writer in one of the recent publieations of the Geological Survey of Australasia, quoted in the *Journal of the Franklin Institute* of Philadelphia, ealls speeial attention to the singular faet—well known to metallurgists though not to the non-expert—that tin is the most sparingly distributed metal in common use. While there is scarcely a eountry in the world in which gold might not be profitably obtained, or from whieh it has uot been obtained in the past, there are at the present time probably not more than a dozen distriets in the world from whieh tin is obtained. The tin deposits of Cornwall, famed in history as the souree from whieh the Phœnicians obtained their tin supplies and whieh have yielded immense quantities eontinuously down to the present time, are now practically exhausted, and the same may be said of the condition of the ore deposits of Bohemla, Tuseany, Southern Spain and the Pyrenees.

In all the vast area of Asia but two distriets are known in whieh workable deposits of tln exist—namely, the Hunan district of China and the Straits Settlement and adjaeent prineipalities, from the latter of which by far the largest quantity of the metal has been obtained for many years.

Thus far no workable tin deposit has been discovered in Africa. In North Amerlca at present there is not a single tin mine in operation, though promising deposits have been located in at least three widely separated localities—viz., Vlrginla, Dakota and Callfornla, which, however, proved unprofitable. In Mexieo extensive deposits of tin are known to exist in the provinee of Durango, whieh one day, when faeilitles for transportation are provided, will doubtless add greatly to the world's supply. At present, however, they remain untouched. Brazil, Bolivia and Peru, in South Amerlea, have paying tin ground, but the yield thus far is comparatively small and is eonfined to the two last named States. Lastly, Australasia is the souree of a eonsiderable supply of tin from lately diseovered deposits ln Australia and New Zealand. At present the product is only about one-tenth that of the Straits, but it is increasing.

HISTORIC WEATHER VANES.

A eentury or two ago weather vanes were held in higher estimation aud were more generally used than at the present time, when the daily papers give a forecast of the weather—correet or not, as may be—for several days in advance. No little skill and taste were displayed in the design and construction of these vanes, as may be readily seeu from the two historie specimens now in the possession of the Washington Association, at Morristown, N. J., and whieh are shown in the aeeompanying illustratiois. Fig. 1 represents a weather vane that was used on the estate of Lord Stirling, at Somerville, N. J. Whlle lt probably oeeupied a neutral position in the matter in dispute between the Continental troops and King George's soldiers, like many other non-eombatants, it did not escape injury. The two bullet holes shown in the tail of the vane are mementos of its experience in the little exehange of eompliments that took place in

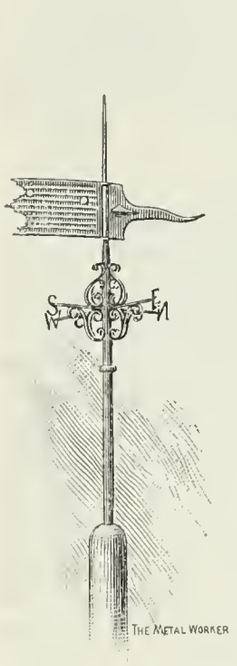


Fig. 1.—Lord Stirling's Vane.

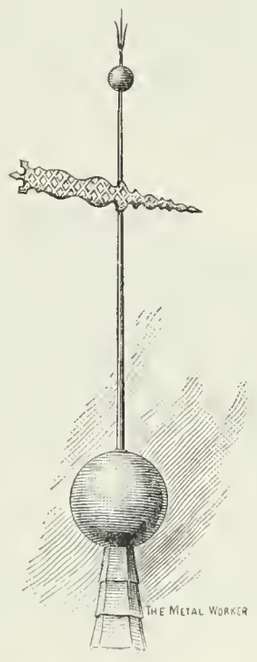


Fig. 2.—The Old Church Vane.

Historic Weather Vanes.

1777. The staff supports an ornamental irou construction, whieh gives the points of the compass.

The seeond vane, shown in Fig. 2, did service on the top of the First Presbyterian Chureh of Morristown, from 1791 until reeently, when the new ehurch was built. It is preserved as a relic at the "Headquarters" maintained by the Washington Association ln the suburbs of Morristown, where many other historie relies are also preserved and on view. Partieularly interesting to readers of *The Metal Worker* would be a visit to the old kitchen of the headquarters, with its equipment of a century and a quarter ago, and also the dining room and parlor with the antique fire baeks, which were among the first manufaetured in the United States. The vane in Fig. 2 still rests in the apex of the old ehureh steeple, whieh was sawed off several feet below the top. A few feet above the wood work is a eopper ball. Our temperanee readers will find pleasure in the faet that this ball was made from three distillers' kettles. It still retains a remarkable trueness of form, testifying to the skillful handieraft of the eoppersmith who produeed it. Above the ball is a weather vane, iu the design of whieh the enrved line of beauty has been used with considerable taste. Above the vane is another eopper ball. The upper ball is probably 9 inches ln diameter, whlle the lower ball is about 2 feet ln dlameter. The top of this spire terminates ln au graeeful trident.

The Interstate Roofing Company.

We have received from the Interstate Roofing Company, Anniston, Ala., a copy of a circular letter dated February 12, announcing that they have succeeded to the roofing and heating department of the Anniston Supply Company. The latter company, in which the present members of the Interstate Roofing Company owned two-thirds of the stock, operated in two lines of business—viz., selling mill and furnace supplies and contracting for roofing, sheet metal cornice work and steam heating. The business having grown to considerable proportions it was deemed advisable to divide it. John H. Frye and G. G. Britton accordingly sold their stock in the supply company and purchased their roofing, metal cornice and steam heating business, which in future will be handled by the Interstate Roofing Company. Attention is called to the fact that the management of these lines under the new company continues the same. G. G. Britton, who handled the roofing business for the Anniston Supply Company for ten years, will continue in charge of this work. The business of the concern in this line has grown in ten years from being a purely local one until at the present time it covers four States. A new line, which is being handled by L. F. Bellengrath, is contract steam heating and sprinkler work. The company are financed by John H. Frye, who was the largest stockholder of the supply company. The officers of the new concern are John H. Frye, president and treasurer; G. G. Britton, vice-president and manager, and John R. Sweets, secretary.

Abolishing the Mill Committee.

According to Theodore Shaffer, president of the Amalgamated Association, a recommendation will be made at the annual convention of the organization, in Wheeling, W. Va., in May, for the total abolition of the "Mill Committee." The Mill Committee is the mill representation of unionism and settles all disputes between the men and the officials, unless they are so serious that a general strike is ordered. It has been claimed that where members of this Mill Committee are biased or inclined to be unjust they can cause no end of trouble to the manufacturers and keep the mill in a state of disorder all the time. The plan is to substitute for this committee a salaried district official, who is to go to all mills and settle all disputes as the representative of the men. This change will be one of the most radical that the Amalgamated Association has ever attempted.

Waterbury Brass Company.

Waterbury Brass Company, with factories at Waterbury, Conn., have lately moved their New York branch to 122-130 Centre street, where they occupy the two lower floors of the building, which is 72 x 100 feet in dimensions. This step has been taken in view of the large increase in their business, and the materially larger quarters now occupied will enable them to carry a much more complete stock than ever before, thus putting them in an excellent position to fill orders promptly and efficiently. In addition to sheet brass, brass wire and rods, German silver sheets, rods and wire, &c., they have added seamless drawn brass and copper tubes, including iron pipe sizes, and intend soon to install a complete stock of cornice copper and hot rolled copper, as well as braziers' sheets. They will also carry yellow metal rods of all sizes. In addition to their sheet metal, rods and wire they will handle finished goods, such as eyelets, special brass wares of various descriptions, including also shells and brass ferrules. The new quarters have been laid out with special care and are admirably adapted to the requirements of the business. The offices are finely equipped and the whole establishment reflects much credit on the company. It is hoped that all friends of the company will make this store their headquarters when in New York, where they will find every convenience and courtesy extended to them.

This company were incorporated in 1845 and received a special charter in 1881. Their New York branch was established in 1846 at 15 Platt street, where they remained for several years, when they moved to 14 Platt street, directly opposite. Here they continued until 1856, when they removed to 52 Beekman street, where they were located for a period of 20 years. The business was then moved to 296 Broadway, where they remained another 20 years. The company then located at 60 Centre street, where they continued until recently, although these quarters were inadequate from the first. During all these years the business steadily expanded, necessitating with each removal increased space for the accommodation of their business.

During the past 38 years the New York store has been under the efficient management of John Sherman, who has been associated with the company since the opening of their branch in this city, a period of more than 54 years, and who is widely and favorably known in the trade. Mr. Sherman will continue to identify himself with the New York house, but he will not be so actively connected with its management as heretofore.

General Fire Proofing Company.

The General Fire Proofing Company of Youngstown, Ohio, have been incorporated with a capital stock of $500,000. The officers are Myron I. Arms, president; W. H. Foster, secretary, and W. A. Kingsley, treasurer and general manager. The new concern have purchased the business of the International Metal Lath Company of Niles, Ohio, and the plant will be removed to Youngstown to be rebuilt on a larger scale and operated in connection with a new works, to be built by the new concern. The company will manufacture general fire proofing and the Herringbone expanded metal lath. The building to be erected will be of steel and brick and the entire plant will be completed with modern machinery throughout. W. A. Kingsley, who is treasurer and general manager, was formerly at the head of the Pomeroy Iron & Steel Company. W. H. Foster, who is secretary, holds the same position with the Youngstown Iron, Sheet & Tube Company. The General Fire Proofing Company and the Youngstown Iron, Sheet & Tube Company, although two separate and distinct concerns, will work very closely together, much of the output of the Youngstown Iron, Sheet & Tube Company being consumed by the General Fire Proofing Company. Work on the new plant will be started as soon as necessary plans can be made.

May Erect Sheet and Tin Plate Plant.

The Marietta Sheet Steel & Tin Company, a concern projected by Laken C. Taylor of Cambridge, Ohio, and others, intend building a sheet steel and tin plate plant upon a site recently secured east of Norwood, a part of Marietta, Ohio. The plant is to contain four hot mills and is to cost about $150,000. A large tract of land, upon part of which the mills are to be located, has been purchased and will be named East Norwood. This has been arranged in plots, and according to the contracts signed with the Marietta Board of Trade, as soon as the requisite number of lots have been sold the company to commence the erection of the mills, and 30 days after completion are to receive a bonus. If the project is successfully launched the Marietta Electric Company, whose power house is located at Norwood, are to extend their line to the new works. The Government dam, just below Marietta, the construction of which has already been provided for, will give water facilities, and running through the tract are the tracks of the Pennsylvania Railroad.

The Frank Mossberg Company, Attleboro, Mass., are sending out an illustrated pamphlet calling attention to their Bicycle Bells, Automobile Bells, Sterling Wrenches and Eagle Pipe Wrenches. The company are prepared to design and construct any kind of special Tools and Dies for sheet metal stampings. They also have a machine shop for the manufacture of special Machinery and Tools for light work, and have installed a complete modern equipment for the purpose. The company are making a specialty of the development of experimental machines. In addition to manufacturing Dies and Tools for sheet metal stamping they are prepared to contract for the manufacture of the finished product from such machines.

THE INDEPENDENT SHEET MILL MEETING.

A second meeting of the independent sheet and black plate mills convened in the Hotel Lincoln, Pittsburgh, on Tuesday and Wednesday of this week. About a dozen or more concerns were represented in person, while three or four of the independent sheet mills were not present. The call for this meeting was sent out on February 11 by A. F. Baumgarten, vice-president of the Maryland Sheet & Steel Company of Cumberland, Md. An organization was effected by the election of W. L. Glessner of the Laughlin Nail Company, operating a sheet mill at Marin's Ferry, Ohio, as president, and A. F. Baumgarten, secretary.

The principal question discussed was the advisability of the independent sheet mills building a basic open hearth steel plant to supply their own steel and make them independent of the market. It was the opinion of some of the independent sheet mills that for each individual mill to build a small open hearth plant is not a wise policy, for the reason that when a reaction comes in the iron trade, as it will some time, the cost of making steel in so many small plants will be so high that the investment will not be a profitable one. It was contended that if the principal sheet mills would go together and build a large open hearth plant with their own blast furnaces, they would be in position to make steel as cheaply as any of the large steel plants that are now in operation.

It was further proposed to make the price of sheet bars the same at all the mills that would have stock in the steel plant, putting them all on an equal basis as regards cost of their bars. However, a few of the sheet mills that now have their own open hearth steel plant, and others that are covered on sheet bars for some months ahead, are not favorable to the project, and the ultimate action to be taken in regard to the matter is still in doubt.

The Biersach Fire Proof Window.

Biersach & Niedermeyer, Milwaukee, Wis., are manufacturing a fire proof window under a patent recently granted to Louis D. Biersach. This fire proof window covers a special construction of the window frame and the sashes. The window frame is so designed that portions of it may be readily removed for the purpose of reaching the sash balance weights and cords. The frame is further so constructed that the sashes are held and guided when raised or lowered by non-corrosive flanges and grooves. In the third place, a special arrangement is employed for forming a tight joint at the upper and lower edges of the sashes. The removable plate arranged for the purpose of reaching the weights and cords is formed with two recesses or grooves which receive sheet brass or other non-corrosive guiding flanges, which are so folded that the outer edge presents a smooth rounded surface upon which the bearings of the sash can slide. Grooves on the sash are arranged to correspond with these flanges, and are provided with a brass or similar non-corrosive bearing surface or lining. Gulding flanges of fire proof sashes and window frames have heretofore usually been formed of one continuous piece with the galvanized sash and frame, and the parts thus constructed are liable to rust and break, especially owing to the fact that when galvanized iron is bent at the sharp angles necessary to form beads and grooves the galvanized surface peels off and the metal is soon destroyed by rust. The close joints at the upper and lower edges of the window sash are secured by the construction of similar sheet brass flanges which enter corresponding grooves. Special means have also been devised for holding the glass in the metal sashes and for easily slipping the glass into place.

The Midland plant of the American Sheet Steel Company, at Muncie, Ind., is being equipped with special machinery for the manufacture of high grade Sheets. A new trimming house is also being erected and the plant is being materially improved in a number of directions. It is at present almost wholly devoted to the production of specialties in Sheets.

FLASHINGS.

Citizens of Elwood, Ind., are reported to be organizing a company for the erection of Tin Plate works at Kokomo, Ind., on a site near the new Steel mill at that place.

The Consumers' Can Company, Baltimore, Md., who were recently reincorporated with a large increase of capitalization, are reported to have made more sales since the first of the year to date than were made by the company in the entire season last year. E. F. Kirwan is president of the concern. The company are the strongest competitors of the American Can Company at the present time.

Oliver H. Burgham, formerly superintendent of the Humbert plant of the American Tin Plate Company, at South Connellsville, Pa., who has been transferred in a similar capacity to the company's mills at New Kensington, Pa., was presented by the South Connellsville Lodge of the Amalgamated Association with a fine gold watch as an expression of the esteem of his former associates. Mr. Burgham is succeeded as superintendent of the Humbert plant by W. Jones.

It is announced that the report referring to an agreement between the Amalgamated Association and the American Steel Hoop Company and the Republic Iron & Steel Company to operate the mills continuously pending the adjustment of the wage scale, is incorrect so far as it included the American Steel Hoop Company.

Thomas Reese, vice-president of the Amalgamated Association of Iron, Steel and Tin Plate Workers for the Niles district of Ohio, died on February 9. He is survived by a widow and two children.

The Youngstown Iron, Sheet & Tube Company, Youngstown, Ohio, have acquired 40 acres of land at Struthers, Ohio, where their new plant is under erection. The property has been purchased in order to provide sufficient room for extensions to the company's plant, which may be required in the future. The concern are now in possession of 172 acres of land at Struthers. The Bar and Sheet mills of the new plant were placed in operation last week and the puddle furnaces will shortly be started.

John Schwing. Bridgeport, Conn., has made a fine metal sign for the new store of Foster, Besse & Co. The letters are made of metal covered with gold leaf, and are of such a size that they can be readily seen for more than a block in the distance. Mr. Schwing is also putting the sheet metal work on the new St. John's Church in Bridgeport.

W. T. D. Hardesty, superintendent of the Falcon Mills of the American Sheet Steel Company, at Niles, Ohio, has been appointed division superintendent and will have charge of the company's plants at Niles and Struthers, Ohio. Charles L. Thomas has resigned the superintendency of the Struthers plant. He is succeeded in the local management of that plant by W. H. B. Ward of Niles.

The foundry of the Frank-Kneeland plant of the United Engineering & Foundry Company, at Pittsburgh, is to be enlarged by an addition of 100 x 100 feet.

The G. Drouve Company, Bridgeport, Conn., have the contract for the sheet metal and copper work for the residence of Charles Mallory, at Port Chester. The company are also making the Cornices and Skylights for the new Art Gallery Hall in Southamptou, L. I.

The plant of the Waukesha Sheet Steel Company, Waukesha, Wis., recently completed, is to be increased to 12 Sheet mills, trebling the present capacity. There will also be added four galvanizing pots, a Bar mill and a corrugating department, contracts for the necessary equipment of which have already been placed. The company have recently been obliged to shut down a portion of their capacity on account of lack of fuel.

H. Weiss & Co., 20 Cliff street, New York, are sending to the trade a circular devoted to the Superior Tinners' Gas Soldering Furnaces, adapted for either artificial or natural gas, and made with either one or two burners, one provided with a cover at the top for melting metals. The circular also shows a Bending Machine

adapted for the use of cornice makers. This machine will bend all kinds of metal bars to a circle, bevel, ogee or square. The machine is said to have a capacity of bending heated angle or tee bars 1½ and 1¼ inches and smaller sizes of metal cold. The machine can be regulated by two thumb screws.

James E. Kelley & Son, gravel roofers, New Haven, Conn., have just completed a number of important contracts throughout the State, among them being the following: Connecticut State Prison, Wethersfield; block for Samuel Taylor, Hartford, and the Union Metallic Cartridge Company, Thomas P. Taylor's block, Connecticut Web Company and the Nichols block, all of Bridgeport.

Henry Weyand, Waterbury, Conn., has the contract for the sheet metal work on two buildings in course of erection at Torrington by George L. Lilley.

The American Sheet Steel Company, New York City, contemplate some substantial repairs to the W. Dewees Wood plant, at McKeesport, Pa., and will replace with new mills some of the worn out machinery. The work of improvement, however, will be of a modest character.

The report that the American Rolling Mill Company, at Middletown, Ohio, had recently bought a plant at Sandwich, Ill., is incorrect. This works was bought by the American Rolling Mill Company of Chicago. The American Rolling Mill Company of Middletown operate at that place a basic open hearth steel plant and Bar mill. They roll Black and Galvanized Steel Sheets, Service Pipes, Sheets and Sheet Steel Building Material of all kinds. George M. Verity is president and general manager; W. T. Simpson, vice-president; R. C. Phillips, secretary, and James B. Strawbridge, general superintendent. Mr. Strawbridge was formerly connected with the Pittsburgh Tin Plate Company, at New Kensington, Pa., prior to that plant being taken over by the American Tin Plate Company.

We have received from the Maire Paint Company, 242 First avenue, North, Minneapolis, Minn., a package of advertising matter calling attention to Maire's Indestructible Roof Preserver. This preparation is adapted for use on iron, wood, tin or metals of all descriptions. It is claimed to be a perfect protector and preserver, which will not crack, peel nor blister, and is guaranteed to stand any climate. The Preserver is described as being made entirely of minerals and contains no oil. It is recommended for stopping leaks, rust and decay on a roof, and is claimed to be unaffected by acids, gases or fumes. Only one coat is necessary on most surfaces. Attention is also called to Maire's Roof Cement for stopping leaks in roofs, and to Maire's Smoke Stack Preserver and Boiler Preserver for boilers, steam pipes and other hot surfaces. The company are also manufacturers of the Hercules and Climax Mineral Paints and the M. P. C. Prepared Roofing.

As the season is approaching when special attention is paid to leaks and defects in roofs that have been developed by the winter storms, George Callahan & Co., 218 Front street, New York, use the opportunity to call attention to the Elastic Paint Oil and Roof Cement, of which they are the manufacturers. These goods, they state, are highly recommended by all who have used them. Tinners and roofers are realizing the importance of having an oil that is elastic to withstand contraction and expansion in the metal used for roofing purposes. The Elastic Paint Oil takes the place of Linseed Oil for roofing purposes at a less cost. It requires no drier or thinner, and is immediately ready for use. The Oil has been on the market for eight years and the demand for it is constantly increasing. The fact that Callahan's Rubber Roof Cement can be readily applied to a wet roof gives that material a great advantage over other preparations for roof mending purposes. The fact that it has maintained its reputation for 15 years speaks highly in its favor.

A general strike of workmen is threatened in Italy. Labor meetings on a large scale are being held in Rome and other cities and the Government has taken extraordinary military precautions to preserve order.

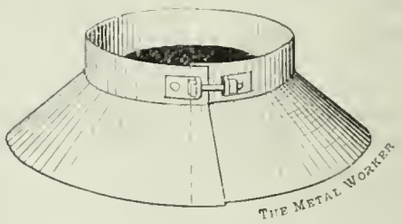
THE LETTER BOX.

Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

COST OF FLANGES AND VENTILATOR.

From C. A. H., West Point, Neb.—In reply to the inquiry of "R. & B." in *The Metal Worker* of January 25, I would say that if they first cut the pattern for the roof flange it will be an easy matter to estimate the price for making the job, as they will then be able to tell within a few ounces how much material will be required. Then, certainly, any experienced tinner should be able to estimate how long it would take to make a roof flange of this kind, and also the ventilator, as shown by the sketch. In regard to riveting a small flange to a smoke stack, I would advise "R. & B." not to do it. A far better way is to make the small flange open and rivet to the top edges two angle irons, with holes through which a bolt can pass to draw the flange tight around the smoke stack by means of a set nut. The flange can



Cost of Flanges and Ventilator.

be made a little longer than is necessary, so that the ends will overlap, and the opening can be left at the back, or anywhere most convenient. I have tried this plan and know it works to perfection.

CAN ALUMINUM CASTINGS BE SOLDERED?

From E. S., Mahwah, N. J.—Will *The Metal Worker* or some of its readers advise me as to whether there is any method by which aluminum castings may be soldered? We understand that there is a solder which can be used for this purpose, but have been unable to find out its nature. Any information you can give us on this subject will be greatly appreciated.

MAKING SEWER CONNECTIONS.

From H. W. C., Elizabeth, N. J.—Please advise me if it is good practice to tap a trunk sewer in the manner described by "J. N. S." in *The Metal Worker* of February 1? I have always considered it better to tap the sewer below the turn of the arch.

Answer.—In all probability it was the intention of our correspondent to show the connection at the turn of the arch, and the slight variation in presenting the sketch may differ from his views on the subject. However, there can be no doubt that it is better to tap the sewer too high rather than too low, the main object being to keep the house drain as far as possible below the surface of the ground to avoid the effect of frost.

THE DURHAM SYSTEM OF HOUSE DRAINAGE.

From B. F. L., Stockton, Cal.—Will *The Metal Worker* be so kind as to inform me as to the character of the Durham system of plumbing?

Answer.—The Durham system of plumbing consists of the use of wrought iron pipe for the house drainage system and special fittings instead of the usual cast iron pipe fittings. These fittings have the same diameter on the inside as the inside diameter of the pipe, a recess being made at the ends for the threads for connection with the pipes.

WHO MAKES SELF FEEDING FURNACES?

From Great Falls Hardware Company, Great Falls, Mont.—We have a call here for a self feeding hot air or combination hot air and hot water furnace. We desire to learn the address of the manufacturers of such goods in which soft coal may be used.

PATTERN FOR TRANSITION PIECE.

From E. G. R.—Would you kindly explain the method for cutting the pattern for a transition piece round at one end and rectangular or square at the other? In this case the round end is 14 inches in diameter, and the other end 8 x 12 inches by 10 inches high.

Answer.—In Fig. 1 let A B C D be the diameter of the round end, shown in elevation by E F, and G H I J the plan of the rectangular end, shown in elevation by K L, the hight of the article being 10 inches, as shown by *a b*.

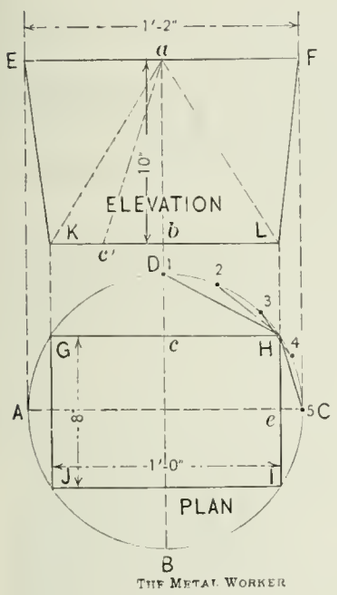


Fig. 1.—Plan and Elevation.

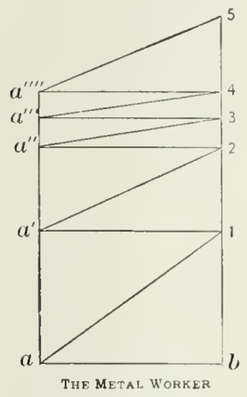


Fig. 2.—Diagram of Triangles.

Draw the diameters A C and B D in plan, as shown. As the rectangular opening is central over the circle, it will then only be necessary to obtain the quarter pattern, *c* D H C *e* in plan, and then join four of these patterns together for the whole pattern. Therefore, divide the quarter circle, D C in plan, into an equal number of spaces, as shown by the small figures 1 to 5, and from these points draw lines to the corner H, as shown. Then will these lines represent the base lines of triangles, which will be constructed, whose altitudes are equal to *a b* in elevation. For the diagram of triangles proceed as shown in Flg. 2.

Draw any horizontal line, *a b*, equal to the hight of *a b* in elevation in Fig. 1. At right angles to *a b* in Fig. 2 and from points *a* and *b* draw vertical lines indefinitely, as shown. Now take the various distances in plan in Fig. 1, H 1, H 2, H 3, H 4 and H 5, and place them on the vertical line in Fig. 2, as shown from *b* to 1, 1 to 2, 2 to 3, 3 to 4 and 4 to 5 respectively. From these points at right angles to 5 *b* draw lines intersecting the vertical line *a a''''* at *a'*, *a''*, *a'''* and *a''''*. Then draw the slant lines 1 *a*, 2 *a'*, 3 *a''*, 4 *a'''* and 5 *a''''*, respectively, as shown, which will represent the true distances on the finished article on similar numbered lines in plan in Fig. 1.

As F L in elevation represents the true flare on C *e* in plan, then obtain the true flare on D *c* in plan by taking the length of D *c* and placing it as shown from *b* to *c'* in elevation. Draw a line from *c'* to *a*, which will give the true flare.

For the pattern draw any line, as 1 *c* in Fig. 3, equal in length to *a c'* in elevation in Fig. 1. Now take the distance from *c* to H in plan, and place it at right angles to 1 *c* in Fig. 3, as shown by *c* H, and draw a line from H to 1, which should be equal to *a* 1 in Fig. 2. Now with radii equal to *a'* 2, *a''* 3, *a'''* 4 and *a''''* 5, and using H in Fig. 3 as center, describe arcs 2 2', 3 3', 4 4' and 5 5', as shown. Now set the dividers equal to the spaces in the quarter plan D C in Fig. 1, and starting at 1 in Fig. 3, step from one arc to another having similar numbers until the point 5 has been obtained. Trace a curve through the points 1, 2, 3, 4 and 5, and draw a line from 5 to H. Now with H *c* in plan in Fig. 1 as radius and H in Fig. 3 as center describe the arc *e*, which intersect by an arc struck from 5 as center and F L in elevation in Fig. 1 as radius. Draw a line, in Fig. 3, from 5 to *e* to H. Then will 1 5 *e* H *c* be the quarter pattern. If the half pattern is desired trace opposite the line 5 *e*, as shown by 5 1' *c'* H' *e*. If the pattern is required in one piece trace opposite the line 1 *c*, as shown by 1 1" *c"* *c*.

INK FOR MARKING TINWARE.

From C. A. H., West Point, Neb.—Will *The Metal Worker* or some of its readers give me a receipt for making an ink for using to mark tinware?

Note.—A good ink for marking tinware is made by reducing asphalt or black varnish with turpentine to the desired consistency. It should be kept in a corked bottle, and, when wanted for use, the bottle should be shaken thoroughly. On withdrawing the cork enough of the marking fluid will adhere to it so that when the pen is applied to the cork it will fill with the fluid. This ink can be used for marking any bright article, as well as tinware, and it can be removed by means of a cloth dipped in coal oil or turpentine. Another ink is made by reducing shellac varnish with alcohol and adding a sufficient quantity of the finest lamp black. This forms a jet black lusterless ink, which is insoluble in water, but can be removed by a drop of alcohol.

A QUESTION OF BOILER POWER.

From G. D. H., New York.—In reply to the inquiry of "T. N. R." in *The Metal Worker* of February 15 I would calculate as follows: If the boiler is rated at 10 horse boiler power, or equal to an evaporation of 35 pounds of water per nominal horse-power per hour, it should supply 3600 feet of 1-inch pipe used as radiating surface in a heating chamber for evaporating moisture from goods; which I infer is meant by your correspondent. Much depends upon the size of the chamber and its required temperature and ventilation as to whether the capacity of the boiler will supply a greater or less quantity of radiating surface than above stated.

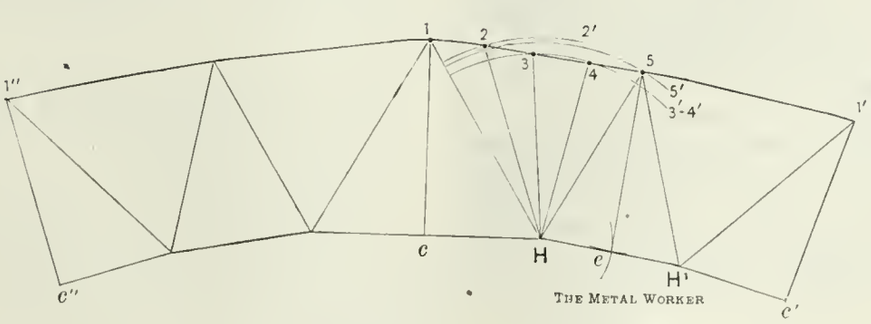


Fig. 3.—The Pattern Shape.

TRADE REPORT.

MARKET SUMMARY.

Pig Tin has advanced ¼c., and is in light demand.

Copper has declined about ¼c.; buying is tame.

Pig Lead is in good demand and firm in price.

Spelter has stiffened about ⅛c., but demand is light.

Antimony is unchanged.

Nickel is in good demand at former prices.

Aluminum is active at unchanged prices.

Tin Plates are firm and without new feature.

Sheets are very strong and active.

Sheet Bars are very scarce, and prices tend upward.

Sheet Copper is in good demand and firm in price.

Scrap Iron is active and higher in price.

Foundry Iron is becoming very scarce, and prices are higher for spot.

Hardware is in good demand, with prices well maintained.

Cast Iron Soil Pipe and Fittings are strong, with probability of an advance in prices.

Galvanized Range Boilers are active and firm, and higher prices may be made before long.

Sanitary Earthen Ware prices have been reaffirmed for another year.

Sash Weights are firmer.

Wire Nails are active and firm.

Cut Nails are steady in price

Window Glass may advance in price.

White Lead is in good demand and prices well maintained.

Linseed Oil is more active with prices firm.

METAL MARKET.

New York, February 21, 1902.

Pig Tin.—Controlling influences in London have brought about another sharp advance in that market. The rise in London had very little effect on this market, however, as prices here have persistently remained below the parity of London quotations. Business here is very slow, most of the consumers being supplied for some months to come. Jobbers' prices rule about ¼c. higher than those of a week ago, Straits Pig, in small lots being quoted at 25¾c. to 26¼c. per lb.

Copper.—Business is very quiet. It is apparent that the consumers are well supplied at low prices, as no business whatever is being transacted for consumptive account. Interest is centered solely in the sparring of the speculators, who have a good supply on hand and are bickering among themselves in an endeavor to unload. There are a good many resales in the market, but owing to the general dullness the metal is not disposed of. When the market looks soft offers are freely made, but as soon as matters stiffen up slightly these offers are withdrawn. The wholesale market price declined about ½c. since last week. Lake Ingot, in small lots, rules at 13¼c. to 13¾c. per lb., and Casting Copper at 13¼c. to 13½c.

Sheet Copper.—The demand for Sheet Copper keeps up in good volume and prices rule firm on the basis of 18c. per lb. from store.

Pig Lead.—A good demand for Lead is reported, and the metal is firm at unchanged prices. Jobbers quote American Pig in small lots at 4.45c. to 4½c. per lb. It is reported that the American Smelting & Refining Company have announced that hereafter no stock of Lead will be carried in New York. In this way nothing better than prompt shipments from the West can be obtained by consumers here. This move is looked upon as another step to force the consumer to carry the surplus stock. While prices were at a fixed basis, with no inducements for the consumers to carry stock, they have simply purchased spot according to their immediate requirements. The present tactics, it is hoped, will bring back transactions in futures. St. Louis advices report a halting tendency in the Lead market at that point with prices showing no change.

Spelter.—The market on Spelter is somewhat firmer. There is, however, a noticeable lack of demand, consumers apparently being well supplied. Retail prices rule at 4½c. to 4⅝c. per lb. for small lots. St. Louis advices indicate that sales are light in the Spelter market, and the price movement is within narrow limits.

Sheet Zinc.—The demand for Sheet Zinc is about of average volume. Jobbers quote 600-lb. cask lots at 6¾c. per lb., and smaller quantities at 7¼c.

Antimony.—There has been no change in this market. Hallett's and U. S. in small lots are quoted at 8¼c. to 8¾c., and Cookson's at 10¼c. to 10¾c. per lb.

Nickel.—The market is unchanged, small lots being quoted at about 55c. to 60c. per lb.

Aluminum.—The demand for Aluminum continues active and prices remain at the level they have held for a long time past. Small lots of No. 1 Ingot, guaranteed 99 per cent. pure, are quoted at 37c. per lb., and 100-lb. lots at 35c.

Tin Plates.—The market for Tin Plates is entirely unchanged. The larger consumers are filling their wants for the first half of the year at present prices, and a fairly active demand from smaller consumers is reported in this market by jobbers. Retail prices are unchanged. American Bessemer Coke Plates, IC, 14 x 20, in small lots, delivered at New York and corresponding points, are selling at about $4.80 to $5 per box. Supplies from mills are coming in rather more freely, but there is no superfluity of Plates in this market. In fact some of the more popular lines are still scarce to obtain for spot delivery. A further advance of 1½ pence per box took place this week in the price of Welsh Plates.

Sheets.—The meeting of the independent Sheet mills, held this week in Pittsburgh, is reported in another column. An active demand is noted for both Black and Galvanized Sheets. The Sheet mill capacity of the country is fully employed on orders sufficient to keep the mills running for the next couple of months or more. A few cases of unevenness in prices are reported among jobbers who have stocks bought when prices were lower, who in some cases are said to be naming lower prices than the mills. The market for both Black and Galvanized Sheets, as a whole, however, is very strong, and the pronounced scarcity of Sheet Bars is likely to still further strengthen the position of the finished material. Jobbers' quotations are firm and without change. No. 27 One Pass Cold Rolled Soft Steel Sheets rule at 3.90c. to 4c., and Galvanized Sheets at 67½ and 5 per cent. to 70 per cent. off the list.

Chicago advices are as follows: The situation from the standpoint of the mills is very satisfactory, as orders are improving and the independent mills are not disposed to make concessions. Heavy Sheets are particularly firm, and the most desirable orders do not tempt any departure from regular rates. Small lots of Black Sheets are selling at 3.35c. to 3.45c. The competition on Galvanized Sheets among jobbers is still sharp, but it is expected that this condition of affairs will shortly improve. The usual price on small lots is 70 and 5, but a lower rate has been made by some houses.

Old Metals.—The demand for Scrap Iron continues active on account of the scarcity and high price of Pig and prices have stiffened. Other Old Metals are moving pretty freely. Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper	per lb.	10¾c.
Light and Tinned Copper	per lb.	9 c.
Heavy Brass	per lb.	8¾c.
Light Brass	per lb.	6¼c.
Lead	per lb.	3⅝c.
Tea Lead	per lb.	3½c.
Zinc	per lb.	3 c.
No. 1 Pewter	per lb.	15¾c.
No. 2 Pewter	per lb.	8 c.
Tin Plate Scrap, per gross ton		.... to $5.00
Wrought Iron Scrap, per gross ton		$12.75 to 13.00
Heavy Cast Scrap, per gross ton		11.75 to 12.00
Stove Plate Scrap, per gross ton		9.50 to 10.00
Burnt Iron, per gross ton		7.00 to 7.50

THE PIG IRON MARKET.

NEW YORK.—There has been a good deal of activity in this market. The Iron available at old prices is lessening in quantity from day to day, and an increasing tonnage is being placed at the higher figures, which quite a number of sellers insist upon. There is a good deal of trouble about deliveries and some anxiety concerning the next month or two. We quote for Northern Irons: No. 1, $18 to $18.50; No. 2 X, $17 to $17.75; No. 2 Plain, $16.75 to $17; Tennessee and Alabama brands, No. 1 Foundry, $16.50 to $17; No. 2 Foundry, $16 to $16.75; No. 1 Soft, $16.50 to $17; No. 2 Soft, $16 to $16.50; No. 3 Foundry, $15.50 to $15.75; No. 4 Foundry, $15 to $15.50.

CHICAGO.—Orders for Pig Iron placed during the past week aggregated a very large tonnage. These orders came from all classes of consumers and covered deliveries running through the last part of the year. Constant pressure is brought on the furnaces to ship Iron faster than the terms of the contract, and premiums of 50c. to $1 per ton are being paid for any kind of Iron available for early delivery. An advance of $1 was made this week on local Iron, but this does not check the demand. Inquiries continue to be received in great number, and the demand is the largest in the history of some of the local sales agents. The coke supply is running so short that no stock can be accumulated. We quote as follows:

Lake Superior Charcoal	$20.50 to $21.50
Local Coke Foundry, No. 1	17.50 to 18.00
Local Coke Foundry, No. 2	17.00 to 17.50
Local Coke Foundry, No. 3	16.50 to 17.00
Local Scotch, No. 1	17.50 to 18.00
Ohio Strong Softeners, No. 1	19.50 to 20.00
Southern Silvery, according to Silicon	16.90 to 17.15
Southern Coke, No. 1	16.40 to 16.65
Southern Coke, No. 2	15.65 to 15.90
Southern Coke, No. 3	15.15 to 15.40
Southern Coke, No. 1 Soft	16.40 to 16.65
Southern Coke, No. 2 Soft	15.65 to 15.90

PHILADELPHIA.—It is useless to attempt to quote prices on Pig Iron, and it is a "go-as-you-can" market. Sellers give no heed to what others may quote, but make their own prices, which depend upon when the Iron is wanted and how much can be delivered. For prompt shipment $17.75 to $18 would be quoted for No. 2 X Foundry. The outlook for more liberal supplies is by no means encouraging, owing to the shortage of cars and Coke, and the snowbound condition of many railroads. The extreme range of prices will be about as follows for Philadelphia and nearby deliveries: No. 1 X Foundry, $18.25 to $18.50; No. 2 X Foundry, $17.25 to $18; No. 2 Plain, $16.75 to $17.

PITTSBURGH.—The United States Steel Corporation have bought 100,000 tons of Standard Besemer Iron for delivery in August and September. This purchase has naturally further strengthened the Pig Iron market, and there is every indication that Iron prices will be higher. Negotiations for the importation of one lot of 5000 tons of Foundry Iron have already been closed. Foundry Iron is active and higher in price. No. 2 is sold in small lots for prompt shipment at $17, furnace. We quote No. 1 Foundry at $17.25 to $17.50, and No. 2 at $17, f.o.b. cars, Pittsburgh.

CINCINNATI.—The past week was a remarkably active one. Orders for all grades of Iron and from all classes of consumers have simply poured in from all sections reporting to the agency headquarters here. A good many orders for large lots of Iron have been booked, and at this writing the movement is unchecked. The leading Southern interest still quotes $12, Birmingham, for No. 2, while some furnaces are asking and obtaining up to 75c. advance over that figure. The general market, however, is based on a range of from $12 to $12.50, Birmingham, for No. 2. The market is very strong, and were it not for troubles in delivery would be almost an ideal one. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$15.25 to $15.75
Southern Coke, No. 1	14.75 to 15.25
Southern Coke, No. 3	14.25 to 14.75
Southern Coke, No. 4	13.75 to 14.25
Southern Coke, No. 1 Soft	15.25 to 15.75
Southern Coke, No. 2 Soft	14.75 to 15.25
Southern Coke, Gray Forge	13.75 to 14.25
Southern Coke, Mottled	13.75 to 14.25
Ohio Silvery, No. 1	17.75 to 18.25
Ohio Silvery, No. 2	17.25 to 17.75
Lake Superior Coke, No. 1	18.10 to 18.35
Lake Superior Coke, No. 2	17.60 to 17.85
Lake Superior Coke, No. 3	16.35 to 16.85

ST. LOUIS.—Actual inquiry and demand are good. Sales are of a heavier order than in recent weeks, for the very good reason that Pig Iron in any quantity gets more difficult to secure from day to day. Many furnaces are refusing to sell at the present Birmingham basis, and are expecting to realize more money for deliveries during the first half of the year. We quote as follows for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry	$15.75 to $16.00
Southern, No. 2 Foundry	15.25 to 15.50
Southern, No. 3 Foundry	14.75 to 15.00
Southern, No. 4 Foundry	14.25 to 14.50
No. 1 Soft	15.75 to 16.00
No. 2 Soft	15.25 to 15.50

CHICAGO REPORT.

Scrap Iron and Steel.—Cast Scrap is in strong demand, and prices are a little higher. Rolling mill stock is not moving, as mills will not pay the prices now asked. We quote dealers' buying prices for carload lots, Chicago delivery, as follows:

	Per net ton.
Country Wrought Scrap	$13.00 to $13.50
Machinery Cast	12.00 to 12.50
Malleable Cast	11.00 to 11.50
Stove Plate (free from burnt)	9.50 to 10.00
Burnt Iron and Grate Bars	7.00 to 8.00
Sheet Iron and Hoops	7.00 to 8.00
Plow Steel	10.00 to 11.00
Breaking Stock	10.00 to 10.50
No. 2, such as Shovels, Hoes, &c	.... to 7.00
Old Boilers—whole (Iron)	6.50 to 7.00
Old Boilers (Iron) cut in single Sheets and Rings	10.00 to 11.00
Old Gas Pipes and Boiler Tubes	11.50 to 12.00
Cast Borings	5.50 to 6.00
Turnings	11.00 to 11.50
Horseshoes	12.00 to 12.50

Old Metals.—The demand is heavy, but stocks held by local dealers are small, as the country dealers are holding for higher prices. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	11 c.
Copper Bottoms	9½c.
Copper Clips	10 c.
Red Brass	10½c.
Yellow Brass	8 c.
Red Brass Borings	9 c.
Yellow Brass Borings	7¼c.
Light Brass	6 c.
Pipe Lead	3.50c.
Tea Lead	3.25c.
Zinc	2.90c.
Tin Foil	18 c.
Pewter, No. 1	16 c.
Pewter, No. 2	14 c.
Aluminum	20 c.

Old Rubber.—Business is light, consumers not buying to any extent. Dealers' buying prices are as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	42.50	.....
Rubber Shoes	....	6.40c.
Rubber Car Springs	....	5½c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6½c.
Black Rubber	....	4 c.
White Rubber	....	8 c.

Rags.—Dealers quote buying prices of good Country Mixed Rags, Chicago delivery, at 75c. to 85c. per 100 lbs. in any quantity.

Anthracite Coal.—A continued heavy demand is reported, with much difficulty in getting shipments, because of car shortage. Nut size is very scarce. Prices are unchanged, as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis	5.75	6.00
St. Louis	6.20	6.45
Kansas City, Mo	8.25	8.50

THE COTTLES HARDWARE COMPANY succeed A. J. Cottle in the Hardware, Stove and Tinware business, at Hartsville, Ind.

THE HARDWARE TRADE.

The trade in several sections is feeling the effect of severe winter weather, which tends to reduce slightly the volume of current business, which, in spite of this influence, continues large and steady. The jobbers and others who visit the rcail trade are fully occupied, their travelers sending in well filled order sheets and reporting an excellent feeling among business men at iarge. It is evident that labor is well employed, factories in almost all lines running to their full capacity and new enterprises being engaged in with a confident and liberal spirit. The demand for structural iron and the reports of architects and builders, as well as those from manufacturers and merchants, agree that building during the present year is going to be exceptionally active, as buildings of aimost all classes are being projected with unusual enterprise. The demand for Builders' Hardware is already large and beyond the capacity of manufacturers to supply promptly. There does not seem to be an immediate prospect of a change in this respect. In quite a good many iines the manufacturers are finding their factories overtaxed and delay is occasioned in the execution of orders. On the other hand, some of the factories are catching up with orders and are making shipments more promptly than for some time. In only exceptional cases is this causing anything of a softening in prices, which are given firm tone by the condition of the iron market, the large demand and the gradually increasing cost of production on account of advances which have taken place in wages. The cost of living being also materially increased as the result of the higher prices ruling for food and practicaiiy all the necessaries of iife is a fact underlying the growing cost of goods. The gradual changes in the values of Hardware during the week in review are comparatively unimportant. Changes are for the most part in the direction of a revision of quotations, which often results in the withdrawal of concessions which have heretofore been made.

NOTES ON PRICES.

Cast Iron Soil Pipe and Fittings.—The market for Cast Iron Soil Pipe and Fittings continues in a very strong position. The demand is heavy, and the output of the various foundries is pretty well contracted for for some time to come. The meeting of the Association of Manufacturers of Cast Iron Soil Pipe and Fittings, to be held on February 26, at Milwaukee, Wis., is expected to bring some important developments and the impression prevails in the trade that higher prices will be announced after that meeting, on account of the high price and scarcity of Pig Iron. Some of the Pipe foundries, especially in the South, are considerably hampered in their operations, because of their inability to secure a sufficient supply of Pig Iron. The condition of the market for the raw material holds out little prospect of relief either in the matter of more liberal supplies or lower prices for a long time to come. Consequently it is reasonable to expect an advance in the price of Cast Iron Pipe.

Galvanized Kitchen Range Boilers.—Reference is made in another part of this paper to the meeting of the Range Boiler Association in New York City this week, and to the proposition for consolidation in that industry. The association has been very successful in maintaining prices as a whole, very few cases of price cutting having come to light. The demand for Range Boilers has been active, and the outlook is favorable for a good business and remunerative prices this year. It is said that if a certain few members of the association can be definitely kept in line, new prices on Range Boilers may be announced that will show an advance over those now in effect.

Sanitary Earthenware.—The Sanitary Earthenware Association held meetings the first three days of last week, and from what can be learned the discussion of affairs became so bitter at one time that the association was on the verge of disruption. For some time past it has been a matter of common knowledge that some of the newcomers in the manufacture of Sanitary Ware have been cutting prices in order to build up business and establish their Ware. This the older established potteries tolerated for a while, because it was practiced to no great extent, and the combined output of the new concerns did not aggregate enough to cause any serious trouble, but so many new concerns have started in business recently and the cutting became so general that several of the older manufacturers thought the only remedy by which the abuse could be stopped was by disbanding the association and making an open market for Sanitary Ware. This, however, did not take place. The association has been held together and the newcomers are in. Allotments have been made which are satisfactory to everybody, forfeits have been posted, and the manufacturers have agreed to maintain prices for another year. Consequently there is little prospect of any change in price for some time to come.

Sash Weights.—The manufacturers of Sash Weights are working together with a good degree of harmony and have recently been giving careful attention to the question of the cost of production and the relation which costs should bear to the selling price. As the result of this we understand that some of them who were making exceptionally low quotations have withdrawn their prices, and the market is thus somewhat more even than heretofore. The high price of the raw material and the difficulty in many cases of obtaining it has also a tonic effect on the market.

Wire Nails.—The general demand for Wire Nails is large and active, but the recent snow storm, which greatly interfered with local transportation, caused a falling off in the store demand in New York during the week. The market is strong. Small lots of Wire Nails from store, New York, are quoted at $2.25 to $2.30 per keg.

Cut Nails.—The Cut Nail market continues firm and steady at former quotations. The local demand was somewhat interfered with by the storm during the week. Small lots from store are quoted at $2.20 per keg.

Window Glass.—The situation in the Window Glass market remains unchanged. One result of the cut in prices by the Independent Glass Company has been to restrict buying to immediate needs. While there is a possibility of higher prices being made by the American Window Glass Company later in the season, there is no evidence of increased buying. Glass from store is quoted by the Jobbers' Association at 90 and 10 per cent. discount.

White Lead.—The demand for White Lead in Oil continues good for the season, and prices are well maintained. Lots of less than 500 pounds are quoted at 6½ cents per pound, and smaller quantities at 6¾ cents.

Linseed Oil.—Buying in Linseed Oil has been more active for the past two weeks. Prices which have been in force since January 29 continue to rule. Small lots of City Raw are quoted at about 64 cents per gallon, and Boiled Oil at 65 cents.

TRADE NOTES.

The Maydole Hammers form the subject matter of an illustrated catalogue of 40 pages that has just been issued by the David Maydole Hammer Company, Norwich, Chenango County, N. Y. The illustrations in the catalogue are beautifully done in natural colors, and show the large variety of Crucible Cast Steel Hammers manufactured by the concern, the reputation of which is world wide.

E. W. Putnam, Hartford, Conn., Pattern and Model maker, is very busy at his plant. Mr. Putnam learned the trade with the United States Rolling Stock Company, and was for 12 years with the Pope Mfg. Company and the Pratt & Cady Company. His shop is fully equipped with modern tools and is centrally located at 187 Pearl street. Mr. Putnam started in business last December and is now employing six experienced men.

The factory of the Hamden Corundrum Wheel Company, Springfield, Mass., was almost entirely destroyed by fire February 16. The loss, about $50,000, is mostly

covered by insurance, and the plant will probably be rebuilt.

Joseph T. Ryerson & Son, 18 to 22 Milwaukee avenue, Chicago, have established an office at 22 and 24 State street, foot of Broadway, New York City. This has been found necessary on account of the rapidly growing Eastern business of the house, particularly on specialties in which they have built up a large trade throughout the United States and Canada.

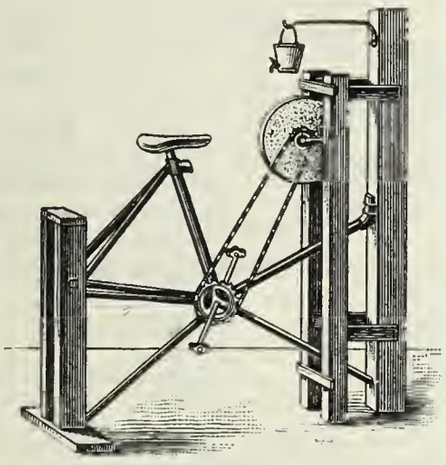
The Amalgamated Graphite Company of New York have been incorporated with a capital of $400,000. The principal office of the concern is at Johnsburg, Warren County, N. Y. The directors are: Wilber F. Whitney of South Ashburnham; Robert Simpson, O. O. Greenwood, S. D. Rowland and Marcella Greenwood of Lowell, Mass.; Charles W. Noble of Johnsburg and J. O. Cunningham of Chestertown.

Edgar A. Jones and Louis J. Cherrier have purchased the retail Stove and Tinware business of Hendriek A. Currier, at Franklin, N. H. Mr. Currier has been in business in Franklin since 1879, when he bought out his brother, J. H. Currier. The members of the new firm are well known business men of Franklin, Mr. Jones having been for years bookkeeper at Walter Aiken & Sons' mill, and Mr. Cherrier having been engaged in the plumbing business in that town.

A Grindstone Scorcher.

A new use for bicycles has been discovered. It is to run grindstones with them. John Arrowood, who claims to be the first to transform the wheel into this useful piece of mechanism, tells the *American Blacksmith*, as follows, how it is done:

I had the frame of an old bicycle and used it in connection with the stone. I first cut out the middle brace



A Grindstone Scorcher.

of the bicycle, and with a 2 x 4 timber made the rear support. Next I stapled the front of the bicycle to a stout post and then made the frame of the grindstone. I braced the bicycle frame underneath. By cutting the spokes out of the rear wheels I secured the small sprocket. I then fitted a small piece of wood into the square hole of the grindstone, bored a hole in the wood the size of the sprocket axle and fitted the axle to the stone. I cut notches in a piece of iron for the axle to rest in and nailed the iron to the frame. As the stone was quite high, it was necessary to obtain two chains and put them together. The machine is now a handy ball bearing grindstone, which runs at lightning speed and cost but little to make.

At the annual meeting, on January 23, 1902, of the Engineers' Club of Scranton, Pa., the following officers for the ensuing year were elected: President, H. H. Stoek; vice-president, B. F. La Rue, professor of civil engineering in the International Correspondence Schools; secretary, A. E. Lister; treasurer, F. J. Platt; corresponding secretary, A. B. Dunning; librarian, H. M. Lane, professor of mechanical engineering in the International Correspondence Schools; directors, W. M. Marple, C. C. Rose and H. W. Rowley. President Stoek is the able editor of "Mines and Minerals," the well-known mining publication, issued by the International Textbook Company, Scranton, Pa., proprietors of the International Correspondence Schools.

The City Council of Chicago recently blocked temporarily the construction of eight new skyscrapers, including seven 16-story and one 14-story building, on which the builders expected to expend about $12,000,000. The action of the Council was taken on account of a strong opposition which has sprung up to these high buildings by the inhabitants of other parts of the city, the claim being made that the lofty structures in the business district tend to confine all trade in the downtown part of Chicago to the detriment of other portions of the city.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED FEBRUARY 21, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₱ lb. 37¢
100-lb lots.....₱ lb. 35¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

	Wider than.....	6-in.	14-in.	24-in.
And including.....		14-in	24-in.	30-in.
		₱ lb	₱ lb.	₱ lb.
Nos 13 to 19.....		$0.42	$0.44	$0.47
" 20.....		.44	.46	.49
" 21 to 23		.46	.48	.51
" 24.....		.48	.50	.53
" 25.....		.47	.51	.54
" 26.....		.47	.54	.59
" 27.....		.48	.57	.62
" 28.....		.48	.57	.64
" 29.....		.49	.60	.69
" 30.....		.50	.64	.77

Note.—Lots of less than 50 lbs 5¢ ₱ lb extra.

Antimony—

Cookson.....₱ lb. 10¼@10¾¢
Hallett's.....₱ lb. 8¼@8¾¢
U.S.....₱ lb 8¼@8¾¢

Brass, Roll and Sheet.....30%

Conductors—Corrugated.

Round or Square.—

Galvanized ½ or more, N'st'd.....70&5%
" Not Nested.....70&2½%
" Plain Round, ⅛ or more, Nested.....70&5%
Galvanized, Plain Round, Not Nested. 70&2½%

Spiral Riveted.

Galvanized.....40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—

See *Strainers, Conductor*

Copper—

Lake Ingot.....13¾@14 ¢
Casting.....13½@13¾¢
Sheet and Bolt.....18¢ ₱ lb basis
Cold Rolled Sheets.....19¢ ₱ lb basis
Cold Rolled and Polished Sheets 20¢ basis
Planished Sheets.....21¢ basis
Bottoms, Pits and Flats....₱ lb 22¢ basis

Eave Trough Galvanized

Territory.	L. C. L.
Eastern	75&10%
Central	75&7½%
Southern	70&12½%
S. Western	70&10%

Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Eastern List.

Tin.....30%
Galvanized.....30%
Perfect Elbows.....40%

Stove Pipe—

Four-Piece

	4	4½	5	5½	6-inch.
No. 1.	$0.80	.85	.90	1.00	1.05 per doz.
No. 2.	.65	.70	.75	.80	.85 "
No 3.	.60	.63	.65	.70	.80 "

Elbows and Shoes—

Galvanized.....60%

Gasoline—

See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, C. R.. Soft Steel.	R. G. Cleaned.
Nos. 14 to 16....	₱ lb. 3.60 ...	3.65¢
Nos. 18 to 21....	₱ lb. 3.70...	3.75¢
Nos. 22 to 24....	₱ lb. 3.80....	3.85¢
Nos. 25 and 26...	₱ lb, 3.90....	3.95¢
No. 27	₱ lb, 4.00....	4.05¢
No. 28	..₱ lb, 4.10.	4.15¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₱ lb 11@14 ¢
Do. Stained.....6@10½¢
Patent Planished. ₱ lb A. 12¢; B, 11¢ net

Galvanized.

Nos. 10 to 16.....₱ lb, 12¢	67½&5@67½&5 off
Nos. 17 to 21.....₱ lb, 13¢	
Nos. 22 to 24.....₱ lb, 14¢	
Nos. 25 to 20.....₱ lb, 15¢	
No. 27.....₱ lb, 16¢	
No. 28.....₱ lb, 17¢	
No. 29.....₱ lb, 19¢	
No. 30.....₱ lb, 21¢	

86 in. 1¢ ₱ lb higher.

Lead—

American Pig.....4.45@4½¢
Bar.....5@5½¢
Pipe.....6½¢.....20% off
Tin Lined Pipe.....12½¢.....20% off
Block Tin Pipe .....35 ¢.....20% off
Sheet Lead.....7¼¢.....20% off
Old Lead in exchange, 3½¢ ₱ lb.

Mitres, Eave Trough—

See *Eave Trough Mitres.*

Nickel—

Per lb.....60@65¢

Paints, Oils, &c.—

Leads—

Lead, American White, in Oil:
Lots of 500 lb or over.....6¼ @ 6½
Lots less than 500 lb.....6⅛ @ 6¼
Lead, White, in oil, 25 lb tin pails, add to keg price..... @ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price..... @ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price... @ 1½
Lead, White, Dry in bbls.....5¾ @ 6
Lead, Red, bbls., ½ bbls. and kegs:
Lots 500 lb or over..... @ 6
Lots less than 500 lb ..... @ 6½

Oils—

Linseed, City, raw.....₱ gal.....54¢
Linseed, City, boiled.....56¢
Linseed State and West'n, raw.....53¢

Spirits Turpentine—

In Southern bbls.....45 @45½¢
In machine bbls.....46 @46½¢

Putty—

In bulk.....$1.25
In bladders.....2.25
In cans 12 lb to 25 lb.....2.25
In cans 1 lb to 5 lb.....3.25

Petroleum Products—

In Barrels (Barrel Included)

Stove Gasoline.....₱ gal.10½@11¢
Kerosene.....₱ gal. 12@13¢

Pipe, Drain.....40%

Pipe, Spiral—

See *Conductors.*

Registers—

List Sept. 2, 1901.

Black Japanned.....60&10@60&10&5%
White Japanned.....60&10@60&10&5%
Nickel Plated.....60&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....60&10@60&10&5%
Electroplated in Brass, Bronze or Copper.....60&10@60&10&5%
White Porcelain.....60%
Solid Brass and Bronze Metal.....50%

Roofing Material—

1 Ply Tarred Paper. ₱ ton.$30.00@31.00
2 Ply Tarred Paper...₱ roll, 108 sq. ft. 50@55¢
3 Ply Tarred Paper..₱ roll, 108 sq. ft. 70@75¢
Slater's Felt.....roll 500 sq. ft., 50@60¢
Roofing Pitch.....₱ bbl. $2 3×

Rosin—

Common and Good—Strained.

Rosin, C. & D.....₱ bbl.	$1.55	@$1.60
Rosin, E. & F.....₱ bbl.	1.60	@ 1.05
Rosin, G. & H ....₱ bbl.	1.70	@ 1.75
Rosin, I. & K .....₱ bbl.	1.95	@ 2.60
Rosin, M. & N.....₱ bbl.	3.00	@ 3.60

Shoes and Elbows—

See *Elbows and Shoes.*

Slate Roofing—

f. o. b. cars, Quarry Station.

	According to size.
Pennsylvania:	
Best Bangor, ₱ sqr. .. ...$3.25@$4.50	
No. 1 Bangor Ribbon. ₱ sq	3.00@ 3.50
Pen Argyle, ₱ sqr.....	3.00@ 3.75
Peach Bottom, ₱ sqr.....	4.85@ 5.60
No. 1 Boys, ₱ sqr.....	3.35@ 3.55
No 1 Chapman Keystone, ₱ sqr	3.25@ 4.25
Vermont:	
Sea Green, ₱ sqr.....$2.00@$3.25	
Purple, ₱ sqr..... ..	8.75@ 4.25
Unfading Green, ₱ sqr...	3.25@ 4.50
Red, ₱ sqr	7.00@11.00
Maine:	
Brownville, Unfading Black:	
No. 1 quality..... .....$5.25@7.50	
No. 2 quality..... ..$4.25@6.00	

Solder—

½&¼ guaranteed..... 16½@17¢
No. 1.....14@15½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	—Per Pound.— Barrels	Smaller Q'ntities
Concentrated Flux.....4c		5c
Eureka Flux:		
Triple Strength... .....3c		3½c
Extra Concentrated.....4½c		5c
Crystal..... ..		7c
Gedney's Fluid.....2c		2c
Lennox Fluid..... .....2c		3c
Perfection Flux.....3c		3½@4c
Yager's Salts, 1 lb. bottles..		each, 50¢
5 lb. bottles, per lb., 45¢		

Soldering Coppers—

Per lb.....20@22¢

Spelter—

Western Spelter.. .....4½@4¾¢

Spiral Pipe—

See *Conductors.*

Stove Pipe Elbows—

See *Elbows, Stove Pipe.*

Stove Trucks—

See *Trucks, Stove.*

Strainers, Conductor—

Galvanized..... . . ..50¢

Tin Pigs and Bars—

Banca, pigs, ₱ lb..... .....25½@26 ¢
Straits, pigs, ₱ lb..... .....25½@26 ¢
Straits, in bars, ₱ lb..... .....26½@27 ¢

Tin Plates, American Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:

1C,	14 x 20.....	....$7.50
1X,	14 x 20....	9.00
1XX,	14 x 20.....	.....10.25
1XXX,	14 x 20.....	.....11.50
1XXXX.	14 x 20.....	.....12.75

Melyn Grade:

1C,	14 x 20.....	7.00
1X,	14 x 20.....	8.50
1XX,	14 x 20.....	9.75
1XXX.	14 x 20	...11.00
1XXXX	14 x 20....	.....12.25

Allaway Grade:

1C,	14 x 20.....	6.50
1X,	14 x 20	7.60
1XX,	14 x 20.....	8.70
1XXX,	14 x 20.....	9.80
1XXXX.	14 x 20.	.....10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	1C, 14 x 20.....	$5.00@5.25
" "	1X, 14 x 20.....	$6.00@6.25

N. B.—The reduction per box on lighter Plates than 1C, 14 x 20, is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb .....25¢
85 lb.....30¢

Terne Plates—

N. B.—The following prices are for 1C 20 x 28, the rate for 14 x 20 being half as much. 1X is usually held at $3 per box advance for 8 to 10 lb coating and $2.50 to $3 advance for 15 lb and upward.

About 40 lb coating.. ..... $16.00@16.50
About 30 lb coating..... 15.25@15.75
About 20 lb coating..... 13.25@13.75
About 15 lb coating..... 11.25@11.75
About 8 lb coating. ....@10.00

Boiler Plates, American—

1XX, 14 x 26..(112 sheets)..... $12.50
1XX, 14 x 28..(112 sheets)..... 13.50
1XX, 14 x 31..(112 sheets)..... 15.00

Troughs, Eave—

See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₱ doz... 18.00

Tubes and Tubing—

Brazed Brass, List June 6, 1898 .....40%
Copper and Bronze, 8c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb. 6, 1899
Tin.....50%
Galvanized.....50%
Fittings for do.....40%

Zinc—

600 lb casks ₱ lb.....6¾¢
Per lb.....7¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
30 gal.....70&10%
35 and 40 gal.....70%
Other sizes up to 52 gal....60@60&10%
52 gal. and above..... .....60%
Extra Heavy Boilers:
18 to 52 gal.....60%
53 gal. and above 55%

Brass Work, Plumbers'—

List of December 7, 1896.

Compression:
Basin Cocks.....65%
Bath Cocks and Double Bath Cocks.. 65%
Bibs.....65%
Bibs, Flanged.....65%
Fuller:
Bibs.....70%
Basin Cocks, Nos. 1 to 4.....70%
Bath Cocks, No. 4½.....$2.40 each net
Ground Key Work:
Finished Bibs.....55&5%
Rough Bibs.....70%
Rough Stop and Stop and Waste Cocks.....70@70&5%
Rough Stop and Stop and Waste Cocks, Patented.....65@65&5%

Miscellaneous—

Basin Clamps.....60@65%
Basin Pings.....60@65%
Chain Stays.....60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face..₱ set	$0.95	$1.05
Ground Face ₱ set	$1.00	$1.10

Sink or Bath and Wash Tray Pings.60@65%
Soldering Nipples.....70&5@75%
Soldering Unions.....70&5@75%
Union Elbows, Hot Water Heating.... 75@75&15%

Cocks, Valves, &c.—

Cocks—

Brass—

Air and Radiator Air .....75@75&5%
Gas Meter and Union Meter.....65@70%
Steam.....65@70%

Iron—

All Iron.....70@70&10%
Iron with Brass Plugs.....65@70%

Valves—

Brass—

Check.....65@70%
Garden Hose..... .....65&10@70%
Gate. .....65@65&10%
Globe and Angle, hose outlet.65@65&10%
Globe, Angle and Cross.. .65&10@70&5%
Horizontal, Vertical and Angle Check... 65@65&10%
Hot Water Radiator 75%
Radiator.....70&10%
Safety.....65%
Safety, Low Pressure.....65%
Jenkins' Disc:
Check... .....65%
Gate.....65%
Globe, Angle and Cross.....70%
Radiator.....80%
Radiator, Corner.....75%
Safety.....65%

Iron—

Iron Body.....70@70&5%
Foot.....65@70%
Jenkins Bros.':
All Iron, except Gate.....40&5%
All Iron Gate..... .....85@40%
Iron Body, except Gate.....60%
Iron Body Gate..... .....50@50&5%
Swing Check..... ....50%

Earthenware—

Brown Glazed Wash Tubs..... .....20%
Brown Glazed Sinks, Kitchen and Pantry 20%
Basins, Urinals and Hoppers.....45%
Closet Bowls, Sundries, Washouts and Pedestals..... ... .50%

Fittings—

Brass Fittings—

Finished.....70@75%
Rough .....70@75%
Bushings.....70@75%
Nipples.....70@70&2½%
Unions, Rough and Finished....70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....65@70%
Cast Iron Bushings and Plugs.... 65@75%
Cast Iron Flanges..... 65@70%
Cast Iron Floor Flanges.....65@75%
Malleable Iron Fittings..... ....70@75%
" " Bushings.....70@70&10%
" " Unions.....70&10@75%
" " Unions, Flange 60&10@70%
" " Pipe Hangers, Universal 50%
Wrought Iron Nipples.....70@75%
" " Couplings... .....60@65%
" " Long Screws.....60@65%

Lavatories—

Porcelain Enameled Iron.....30@30&10%

Oakum—

Plumbers' Oakum, 50 lb. bales, ₱ lb 2½¢

Pipe—

Brass, Iron Pipe Size—

⅛	¼	½	¾ to 3 inch
$0.33	.31	.29	.23 ₱ lb

Cast Iron Soil—

List Feb. 25, 1901.
2 to 6 inch inclusive.

Standard.....60&5%
Extra Heavy..... ...65@70%
All Fittings.....70@70&10%

Wrought Iron—

List Feb. 15, 1900.

	Black.	Galv.
⅛ to ¼ inch	57%	43%
⅜ to 12 inch	64%	51%

NOTE.—*Manufacturers' prices are much lower than above, but prompt shipments are not obtainable.*

Radiators—

Standard List.

Steam.....50&2½%
Hot Water.....50%

Sinks, Etc.—

	Cast Iron—Black	Galv.
Sinks, Square, Half Round and Corner	60@65%	60@65%
Sink Legs.	60%	60@65%
Sink Backs	60%	60@65%
Boiler Stands, Cast Iron	60@60&10%	
Cesspools, Cast Iron	60%	

Wrought Steel Sinks—

New Era, Galv'd and Enameled. ..70&5%
New Era, Painted.....50&10%
L. & G.....50%

Traps—

Drawn Lead Traps, List June 3, 1901..... 55@55&5%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns, Guaranteed, 45@50%
All Special Patterns.....25%
Non-guaranteed Brands, complete line .....45@50%
Solid Copper, list of Feb. 1, 1899.....40%
Solid Porcelain—Class A, 30%; B, 40%; C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899.....50@55%

ALPHABETICAL LIST OF ADVERTISERS.

Adam, W. J. 26
Adler, H. & Co. 11
American Blower Co. 21
American Furnace Co. 12
American Sheet Steel Co ...1&72
American Steam Gage & Valve Mfg. Co. 1
American Steel Roofing Co... 70
American Tin Plate Co. 72
Anderson Conpling Co. 29
Asphalt Ready Roofing Co .. 73
Barstow Stove Co. 80
Peckwith, P. D., Est. of..... 2
Berger Bros. Co. .....67&69
Berger Mfg. Co 74
Berenstom Bros. & Co. 19
Bertsch & Co. 78
Bliss, E. W. Co. 78
Blodgett, G. S. Co. 22
Bonnot Co. 22
Brand Stove Co. 20
Bray, J. & Co. 68
Bridgeport Crucible Co. 25
Brien Heater Co. 21
Bruce & Cook. .....73&80
Burgess Soldering Furnace Co. 29
Burton, W. J. & Co. 21
Callahan, Geo. & Co. 67
Cambridge Rolling Mill Co... 70
Canton Steel Roofing Co. 75
Challenge Refrigerator Co.. 64
Chamber of Commerce. 63
Cincinnati Stamping Co. 76
City Forge & Iron Works..... 26
Clad, V. & Sons, Inc. 65
Clark, Geo. M. & Co 15
Clark, Henry N. Co. 17
Clark Novelty Co. 66
Clark, Quien & Morse. 71
Clason Arch. Metal Works... 68
Clayton & Lambert Mfg. Co.. 28
Clough, E. M. 79
Coe, Jas. A. & Co. 78
Colwell Lead Co. 28
Cooney & Geiger. 67
Cooper & McKee. 64
Cope, Geo. W 26
Cortright Metal Roofing Co... 77
Cory, Uzal & Co 22
Crosby Steam Gage & Valve Co. 1
Curtis & Curtis Co. 29
Danzer Metal Works. 76
Day Metallic Mfg. Co. 28
Detroit Stove Works. 11
Dighton Furnace Co. 23
Dixon, Jos. Crucible Co. 68
Double Truss Cornice Brake Co 76
Dowman Mfg. Co. 67
Drake W. H. 21
Dreis, Andrews & Krnmp..... 76
Drouve, G. Co. 68
Eclipse Stove Co. 10
Edwards, J. H. 28
Edwards Mfg. Co. 74
Eller, J. H. & Co. 75
Energy Elevator Co. 65
Enterprise Stove Co. 12
Excelsior Tool & Mch. Wks.. 78
Fanner Mfg. Co. 27
Fenn, Geo. E. 67
Floyd, Wells & Co. 17
Follansbee Bros. Co. 1
Foster, F. W. Mfg Co. 27
Frand, Martin J. & Co 75
Friedley & Voshardt. 74
Frink, I. P. 80
Fuller & Warren Co. 1
Galt, John & Sons. 68
Garry Iron & Steel Co. 76
Genuine Bangor Slate Co..... 68
Gerock Bros. Mfg. Co. 68
Giblin & Co. 16
Globe Ventilator Co. 67
Gobeille Pattern Co. 25
Gorton & Lidgerwood Co. 1
Graff Furnace Co. 16
Gummey, McFarland & Co... 71
Gunster & Forsyth. 29
Gurney & Co. 20
Gurney Heater Mfg. Co. 17
Gurney Refrigerator Co. 65
Hamlin, G. R. 66
Hanson & Van Winkle Co..... 27
Harper & McIntire Co. 11
Harrington & King Perforating Co. 59
Hart & Crouse Co. 19
Heath, C. C. & Co. 26
Hess-Snyder Co. 14
Hoffman, Geo. W. 25
Howard Thermostat Co 20
Howson & Howson 66
Independent Register Co..... 22
International Correspondence Schools. 63
International Heater Co..... 3
Janney, Steinmetz & Co..... 75
Jenkins Bros. 1
Johnson, E. J. & Co. 68
Keene, Geo. C. & Co 79
Kelsey Heating Co. 80
Kemp, C. M. Mfg. Co. 28
Kewanee Boiler Co. 23
Kieley & Mueller. 1
Kirk Mfg. Co. 26
Koven, L. O. & Bro. 23
Kramer Bros. 67
Lalance & Grosjean Mfg. Co.. 64
Lawless, John H. 28
Lawrence-Letts Elbow Co.... 24
Lennox Manufacturing Co... 21
Littleford Bros. 69
McClure & Co. 80
McLeod & Henry Co. 1
McSherry, Chas. 77
Magee Furnace Co 1
Marcy Stove Repair Co. 25
Marston, I. G. & Co. 28
Metropolis Sheet Metals & Stove Repairing Co. 22
Meurer Bros. Co. 71
Millar, Chas. & Son Co. 80
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Sheppard, Isaac A. & Co., Phila., Pa.
Smith & Anthony Co., Boston, Mass.
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Twin Burner Vapor Stove Co., St. Louis, Mo.
Weir Stove Co., Taunton, Mass

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Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Stoves and Ranges, Oil, Vapor and Gasoline.
Clark, Geo. M. & Co., Chicago, Ill.
Heath, C. C. & Co., Philadelphia, Pa.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
National Vapor Stove & Mfg. Co. Lorain, O.
Rathbone, Sard & Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, O.
Standard Lighting Co., Cleveland, O.
Taylor & Boggis Foundry Co., Cleveland, O.
Twin Burner Vapor Stove Co., St. Louis, Mo.

Street Lamps, Gasolene.
Merkel, H., St. Louis, Mo.

Tanks, Steel and Wood.
Edwards, J. H., 59 Park Place, N. Y.

Terne Plates.
American Tin Plate Co., New York.
Taylor, N. & G. Co., Phila., Pa.

Tinners' Tools, Machines and Supplies.
Berger Bros. Co., Phila., Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn N. Y.
Weiss, H. & Co., 20 Cliff St., N. Y.

Tinners' Trimmings.
Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate.
American Tin Plate Co., New York.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

Tin Scrap.
Vulcan Metal Refining Co., 157 Cedar St., N. Y.
Vulcan Western Co., Streator, Ill.

Tinware.
Shepard, Sidney & Co., Buffalo, N. Y.

Tools and Machines, Steam and Gas Fitters'.
Curtis & Curtis Co., Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Torches, Plumbers.
Clayton & Lambert Mfg. Co., Detroit, Mich.

Tubing.
Kirk Mfg. Co., Toledo, O.

Valves.
Am. Steam Gage & Valve Mfg. Co., Boston, Mass.
Crosby Steam Gage & Valve Co., Boston, Mass.
Jenkins Bros., 71 John St., New York.
Morgan & Co., Chicago.

Ventilating Apparatus.
American Blower Co., Detroit, Mich.

Ventilators and Chimney Caps.
Wood, James, Newton, Conn.

Ventilators and Chimney Caps.
Berger Bros. Co., Phila., Pa.
Dowman Mfg. Co., Atlanta, Ga.
Fenn, Geo E., Boston Mass.
Globe Ventilator Co., Troy, N. Y.
Kramer Bros., Dayton, O.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, O.
Marston, I. G. & Co., Boston, Mass.

Washing Machines.
Wayne Anthony Mfg. Co., Ft. Wayne, Ind.

Water Coolers.
National Enameling & Stamping Co., 78 Beekman St., N. Y

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Water Fronts.
Clark, Henry N. Co., Boston, Mass.

Water Heaters.
Adam, W. J., Joliet, Ill.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.
Miner & Peck Mfg. Co., New Haven, Ct.

SEE ALPHABETICAL INDEX, PAGE 59.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Official letters of reference should not be inclosed with replies to advertisements appearing in these columns as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

I have an opening for an up to date hardwareman, one who has had experience and is a good salesman, also a good hand to display stock, &c.; must be sober; steady job to the right man. Box 20, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 22

Wanted, a PIPE FITTER who has a thorough knowledge of iron conduit work for electrical house wiring for light, bells, telephones, &c.; one who has had experience and is qualified to do good work; state terms and particulars as to knowledge of electrical apparatus. "Good job," care *The Metal Worker*, New York. Feb. 22

SUPERINTENDENT for range boiler factory; must understand work thoroughly; answer, stating full particulars, where employed, wages asked, &c. "Range Boilers," care *The Metal Worker*, New York. Feb. 22

First-class STOVE PATTERN MAKERS; only men that thoroughly understand their business need answer; good wages and a steady position. The Richmond Pattern Works, Richmond, Va. Feb. 22

Experienced TIN PLATE and METAL TRAVELING SALESMAN for our Philadelphia branch house; give experience, salary desired and references. Follansbee Brothers Company, Pittsburgh, Pa. Feb. 22

FOREMAN for galvanized iron shop. "A. B. C.," care *The Metal Worker*, New York. Feb. 22

SUPERINTENDENT for a cornice and skylight works employing 60 hands; state experience, age, salary wanted and references. "M. L. K.," care *The Metal Worker*, New York. Feb. 22

For a large country hardware store, a good TINNER with knowledge of plumbing, pump and gas fitting; one who can sell hardware and implements; steady job to right man; middle aged man preferred; state references, price, experience, &c. Poplar Ridge Hardware Company, Poplar Ridge, N. Y. Feb. 22

An experienced FOREMAN for established tin shop making cans only; up to date men only need apply. Address "Tinner," care *The Metal Worker*, 312 The Cuyahoga, Cleveland, Ohio. Feb. 22

Fifteen first-class STOVE MOUNTERS to work on gas ranges. Abendroth Bros., Port Chester, N. Y. Feb. 22

We want to secure the services of a good jobbing TINSMITH; must be a good all round mechanic, sober and quick worker; to a good man a steady job is offered. Apply by letter, with reference. Clark & Morton, West New Brighton, N. Y. Feb. 22

A good all around PLUMBER and TINNER; one that can do all work that comes to a country shop; must be strictly temperate and honest; state age, experience and wages wanted. W. Irvin Renninger, Denver, Pa. Feb. 22

Good TINNERS and CORNICEMEN wanted. "Employer," care *The Metal Worker*, New York. Feb. 22

A strictly first-class union PLUMBER, STEAM and GAS FITTER; one who is a sober man and thoroughly understands plans; references required. "W. H. D.," 22 Catharine street, Schenectady, N. Y. Feb. 22

A first-class WOOD PATTERN MAKER familiar with stove work and able to direct iron pattern work. Apply to A. J. Lindemann & Hoverson Company, Milwaukee, Wis. Feb. 22

A young man with some knowledge of tin roofing and spouting; one who would like to learn the plumbing trade, or has had some experience in the plumbing business preferred. "Mich.," care *The Metal Worker*, New York. Feb. 22

A competent man as FOREMAN and INSPECTOR in our mounting department; must understand range, stove and furnace mounting. The Richmond Stove Company, Norwich, Conn. Feb. 22

A good all around TINSMITH for a hardware store in a small village; must be honest, reliable and temperate; wages about $8 or $9 per week; must furnish reference. H. H. Dutton, Burlington Flats, Otsego County, N. Y. Feb. 22

STEAM and HOT WATER SALESMAN for Pennsylvania and vicinity. The Reading Stove Works, Orr, Painter & Co., Reading, Pa. Feb. 22

A first-class PLUMBER and PIPE FITTER; one that can do ordinary sheet iron work preferred; steady work and good pay to the right man. "Massachusetts," care *The Metal Worker*, New York. Feb. 22

TINSMITH, at once, to work near Boston; must be an expert tinsmith used to country work; not required to do plumbing; say what kind of work you have done and send references where you have worked five years or more; will pay $2.75 for nine hours. "Tinsmith," 36 Union street, Boston, Mass. Feb. 22

All around TINSMITH; one that understands plumbing, steam heating and pump work; steady work for right man; state wages expected and give references. J. P. Brownell, Riverside, R. I. Feb. 22

A WORKING FOREMAN in tin and cornice shop, capable of detailing, cutting and constructing galvanized iron cornices, skylights, tin roofing, slating and job work; state age and wages wanted; steady job to the right man; must be temperate and reliable. Waterloo Cornice Works, Waterloo, Iowa. Feb. 22

A first-class TINSMITH and PLUMBER for all around work in country shop; must come well recommended, sober and reliable, or do not apply; steady job to right person. Burchard Bros., Oxford, N. Y. Feb. 22

At once, a first-class PLUMBER and TINNER; can do inside and outside work, with some knowledge of hot air furnace work, must be strictly temperate; will pay $2.25 per day to the right man. N. B. Twogood, Mt. Vernon, Iowa. Feb. 22

Wanted, A1 PLUMBER, STEAM and HOT WATER FITTER, with some knowledge of tin and sheet iron work; must be steady, sober and reliable; give references, wages wanted; married man preferred; to right man will give steady job. Martin & Kuebler, Viroqua, Wis. Feb. 22

First-class workers in SHEET METAL; to the right men we have steady employment the year round; state experience, references and wages expected. "Worker," care *The Metal Worker*, New York. Feb. 22

A first-class SALESMAN to represent a good selling, modern line of stoves, ranges and furnaces in Eastern Pennsylvania. "Eastern Pennsylvania," care *The Metal Worker*, New York. Feb. 15

Wanted at once, several good SHEET IRON WORKERS as road mechanics; those used to erecting blow pipe work preferred; state age, wages expected and where last employed; none but good mechanics need apply. The Ohio Blow Pipe Company, corner Seneca and Michigan streets, Cleveland, Ohio. Feb. 15

FOUNDRY SUPERINTENDENT with knowledge of molding; must have executive ability to manage men and get work out to advantage; special experience in our line of work not required; state experience, age and references; good position and salary for right man. Richmond Stove Company, Norwich, Conn. Feb. 8

SITUATIONS WANTED.

A young man of several years' experience in foundry would like to travel for any well established firm in hardware; stoves preferred; no experience; present occupation steel range maker. Box 22, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 22

A position as PLUMBER; first-class workman; sober, reliable; references; any State west of Chicago; union man. Box 19, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 22

A practical PLUMBER and GAS FITTER of 12 years' experience in small sized town; at present employed in large city; neat and careful workman; sober, reliable and 30 years of age; married; best of references furnished. Box 21, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 22

By STEAM and HOT WATER FITTER who can do plumbing, pump work and gas fitting; strictly sober; can furnish best of references; can go anywhere. Box 1233, Corry, Erie County, Pa. Feb. 22

By A1 TIN and SHEET IRON WORKER with 17 years' experience; is good at bench or outside work; can lay out his own patterns; is married; would like steady position with some good firm. Jos. Kelly, 446 Second street, Niagara Falls, N. Y. Feb. 22

BOILER SALESMAN with extensive acquaintance with trade in Pennsylvania is open for position; thoroughly experienced in construction, estimating and soliciting; has a good trade and can furnish unquestioned reference; can guarantee results. "J. A. L.," care *The Metal Worker*, New York. Feb. 22

Man (26), single, strictly sober, speaking German, wants steady position, city or country, where he could finish trade; has three and a half years' experience in plumbing, tinning and steam fitting trade; can do jobbing; if possible board with employer; first-class references. "A. S.," care of Steinert, 78 East Ninety-sixth street, New York. Feb. 22

By temperate, reliable young man (25), at PLUMBING, GAS FITTING and GENERAL JOBBING, six years' experience; some knowledge of tin roofing and spouting; city or country work. "P., Plumber," care Box 306, Bridgewater, Mass. Feb. 22

First-class PLUMBER and GAS FITTER wants work; city or country; 12 years' experience. J. O'Hare, 459 West Thirty-fifth street, New York. Feb. 22

By young man with two and a half years' experience at the tinsmith trade; would like to finish learning trade with good man; am sober and willing. Harry Milden, Marlboro, N. Y. Feb. 22

By young man, 22, with several years' experience with local stove and tinware house, as SALESMAN or SHIPPING CLERK or on the road; good references. "Billy," 600 Fifth street, Lynchburg, Va. Feb. 22

SALESMAN, 42 years, educated, intelligent, temperate; over 20 years' experience in stove, range and furnace trade; open for 1902; for 15 years past have traveled Pennsylvania, New Jersey, Delaware, Maryland, Virginia, New York and New England States; an economical traveler and conscientious, persistent worker. Edward D. Purves, Box 45, Parkertown, N. J. Feb. 22

By a first-class TINSMITH having 12 years' experience in cornice and furnace work, also able to estimate on all styles of work; country town in Central States preferred. "P. A. C.," care Columbian Novelty Company, 921 Franklin avenue, St. Louis, Mo. Feb. 22

By young man, 21 years old, with some reliable party; is willing to work in any State in the Union if wages are good; have A1 reference, can also give $50 security if required. T. J. McKenna, 48 Montauk avenue, Brooklyn, N. Y. Feb. 22

By a sober and reliable TINSMITH having ten years' experience at the trade on roofing, spouting, tinware and general jobbing, also considerable knowledge of plumbing and steam heating; wages, $11 per week for steady position. "T. G.," Rockville, Conn. Feb. 22

BOOKKEEPER, age 30, single, thoroughly experienced in manufacturing line; up to date methods; all around man; can install good cost system; capable of taking charge of office; exceptional references; salary required, $20 per week. "W. S.," care *The Metal Worker*, New York. Feb. 22

Steady position by all around SHEET METAL WORKER; 16 years' experience in cornice, furnace, skylight and heavy riveted work; can cut and lay out work or take charge of shop. "B. W.," care *The Metal Worker*, New York. Feb. 22

By FOREMAN in hot air furnace or job shop; good at plumbing, steam fitting and all kinds of tin work in and outside; 19 years' experience. Wm. Jones, rear of 406 St. Clare street, Cleveland, Ohio. Feb. 22

By a young man, 33 years of age, practical PLUMBER and GAS FITTER; 18 years' experience at the trade; licensed and registered by the New York Board of Health and Department of Public Works; has had charge of men; can figure from and read plans; would like position as journeyman or take charge of work. Address, with full particulars, P. H. Becker, 1980 Daly avenue, New York. Feb. 22

By first-class PLUMBER, PIPE FITTER and FURNACE WORKER; 15 years' experience; sober and industrious; wages, $2.50 a day; city or country. James Yancer, 531 Grant avenue, Van Nest Park, New York. Feb. 22

PLUMBER, licensed, would accept steady position with tinsmith controlling some plumbing trade; 15 years' experience; sober and reliable; handy at ranges, heaters and furnaces; job must be steady; wages $3 per day. John McLean, 1012 Fourth avenue, Brooklyn, N. Y. Feb. 22

By good all around TIN and SHEET METAL WORKER; have had several years' experience in country job shops; am good salesman and can devote part or whole time to selling goods if preferred. George W. Durfey, Burlington, Vt. Feb. 22

As SUPERINTENDENT or FOREMAN; an American, strictly temperate and can handle men to the best advantage, by a first-class tin, copper and sheet iron worker, understanding plumbing, steam and gas fitting; have been in the business for 20 years. "D.," care *The Metal Worker*, New York. Feb. 22

A convincing, energetic business increasing SALESMAN with ability, good address and habits; 15 years' experience in stove, sheet metal and plumbing and heating line; expert solicitor, estimator and supervisor; lay out man on steam, hot water and hot air heating. "Estimator," care *The Metal Worker*, New York. Feb. 22

As CLERK in retail hardware or stove store; ten years' experience; can furnish best of references; would like position by March 1. "Clerk," care *The Metal Worker*, New York. Feb. 15

By a first-class PATTERN FILLER and MENDER; one year's experience in fitting. "Filler," care *The Metal Worker*, New York. Feb. 22

By a practical STOVE and FURNACE-MAN; one familiar with all the details of the business; can fill any position from manager to salesman. "Able," care *The Metal Worker*, New York. Feb. 22

SALESMAN with experience and acquaintance with hardware, house furnishing and department store trades wants position, either on salary or commission; best of references. "C. E.," care *The Metal Worker*, 70 Kilby street, Boston, Mass. Feb. 22

A young man, temperate, honest and reliable, would like a steady position; understands plumbing, steam and gas fitting, pump work; good jobber; four years' experience: prefer to work in Eastern States. Robert Gregory, Norwalk, Cranbury, Conn. Feb. 22

By a first-class PLUMBER, GAS and STEAM FITTER; can do all ordinary tin work; can figure and take charge of work; 16 years' experience; would like steady work. "Fitter," Sistersville, W. Va. Feb. 15

PLUMBER wants steady employment; good, quick worker; city or country; Western Pennsylvania preferred; first-class on lead work and up to date on sanitary matters; sober and best of reference as to my character and ability. "J. S.," plumber, 421 West Thirty-second street, New York. Feb. 15

By first-class steam fitter as FITTER, ESTIMATOR or WORKING FOREMAN; some experience at soliciting; moderate wages. Robert Doyle, 106 West Sixty-first street, New York. Feb. 15

By SHEET METAL WORKER and general jobber at inside and outside work; 20 years' experience; steady position in country desired. Chas. Willis, 428 West Eighteenth street, New York. Feb. 15

As FOREMAN, CUTTER or BENCH WORKER in cornice and skylight shop; in or outside work; German; first-class worker. Adolf Klein, 403 East Eleventh street, New York. Feb. 15

By a good CORNICE CUTTER and DRAFTSMAN; practical and reliable; can take charge of shop, handle men and estimate from plans. "H. D.," care *The Metal Worker* 117-119 South Fourth street, Philadelphia, Pa. Feb. 15

By a first-class PLUMBER; 18 years' experience; will work anywhere. Joseph Reilly, 412 West Thirty-second street, New York. Feb. 15

Having had 12 years' experience in steam, water and gas fitters' supply business, would like to make contract to represent reputable concern in territory from Philadelphia to Norfolk. "B. Z.," care *The Metal Worker*, New York. Feb. 15

By a TIN and SHEET IRON WORKER, any kind of work, piece or day or general jobbing shop. "Smith," 284 Third avenue, New York. Feb. 15

Side line, by first-class SALESMAN who calls on the stove and hardware trade from Chicago to Atlantic Coast; in position to command good trade. "Stove Man," care *The Metal Worker*, New York. Feb. 15

By an A1 man in the tinware manufacturing business as SUPERINTENDENT; 30 years of age, wide awake and a head full of new ideas; can keep men in good temper yet manage to get their highest efficiency; desire answers from large manufacturing firms that are reliable, able and willing to pay good salary for a good man; can furnish good references. Box 16, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 15

By STEEL RANGE and COOK WORKING FOREMAN; can educate help and lay out templets; age 34, married, reliable. "Sheet Steel," 1 Church street, Detroit, Mich. Feb. 15

By first-class PLUMBER; all around mechanic. P. J. Kelly, 132 Gold street, Brooklyn, N. Y. Feb. 15

As CUTTER and FOREMAN in a galvanized iron cornice shop by a man thoroughly competent to handle every department of the business; 19 years' experience as a foreman. W. B. Rising, 1015 Spring street, Shreveport, La. Feb. 15

First-class PLUMBER wishes work in city or country; wages moderate. W. Kelly, 307 East Sixtieth street, New York. Feb. 15

STOVE and HEATER SALESMAN or position as salesman with a large stove and heater business, store or foundry, by a practical man; also practical experience on bidding and setting up of all kinds of heater work, a position to travel or position in store, foundry or office; fully able to bid on all kinds of stove and heater work. "Stove Salesman," care *The Metal Worker*, New York. Feb. 15

As FOREMAN in the tin and sheet iron department of a foundry making ranges and warm air furnaces; am thoroughly familiar with all work connected therewith and also understand indirect steam heating and ventilating; can furnish best of reference, having had 24 years' experience. "John G.," care of Frank H. Wilson, 3829 Germantown avenue, Philadelphia, Pa. Feb. 15

Bankrupt Sale.

CAN MAKING MACHINERY.

The modern machinery, dies, tools, etc. constituting the plant of the Brooklyn Can Co., together with raw material and finished product, will be sold at ***Public Auction,*** at 265 Water St., Brooklyn, N. Y., on Thursday, February 27th, at 10:30 A. M. This machinery has been in use only about six months.

A. T. STOUTENBURGH,

Receiver in Bankruptcy,

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FOR SALE.

A stove, sheet-iron, hollow-ware, tinware, copper, heating and plumbing business situated in New England. Stock and tools amounting to $1200 or $1500.

Address "A A.,"
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FOR SALE.

A stock of Hardware, Stoves, Tinware, Plumbing and Tinsmith Tools and Material, invoicing about Five Thousand. Located in the Richest Silver and Lead Mining Country in the United States. A good opportunity for a good man. Good reasons for selling. Call or write.

H. A. STEINKE,
Wallace, Idaho.

SALESMAN,

15 years experience in Hardware, House Furnishing and Department Store Trades, wants a few manufacturers' lines. Salary or Commission. Best of references.

Address "A. B.,"
care *The Metal Worker*, 70 Kilby St., Boston, Mass.

Are you looking to buy an old established Tinning, Plumbing and Heating Business in a live town? If so, write to

"LIVELY,"

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New York.

FOR SALE.

A first-class Stove, Plumbing and Heating business. In a growing city of 23,000 inhabitants. Will inventory between $5,000 and $6,000. No fair offer will be refused. Terms cash. For full particulars address

"G. K.,"
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Overstocked With Sheet Steel.

Can sell 5000 sheets 16¼ in. x 18 in. No. 19 and 1400 sheets 16 in. x 40 in. No. 20, cold rolled, pickled and annealed.

Address "G. D. M.,"
1117 Union Trust Bldg., Detroit, Mich.

MUST BE SOLD

by April 1st, a Stove, Heater, Furnace and Tinroofing business, in a Pennsylvania town of 15,000. Will inventory about $4000. Established for 25 years, doing a good profitable business. For $3200. Reason for selling, have other business.

Address "HUGH,"
care *The Metal Worker*, New York.

FOR SALE CHEAP.
THE FOLLOWING NEW TOOLS.

One 10-foot power press, weight 20,000 lbs. One 10-foot power squaring shears. One hand bender. All made by Geo. A. Obi & Co.

One double punch and shear, 10-inch throat, capacity ⅝-inch hole in ⅝-inch iron. One wire straightening and cutting machine, capacity ¼-inch wire 26 inches long or less. Address

"TOOLS," care *The Metal Worker*, New York.

For Sale.

Well established hardware, tin and stove business, together with a well paying tinshop, with or without property. Is one of the best locations for an enterprising man to make money. Possession Jan. 1st or later.
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Sheet Metal Pattern Cutting. Complete course $15. $1 per month. Course when completed will enable you to cut anything in the sheet metal line and includes 100 plates, 13x18 in., which alone are worth more than price of course. Send for sample plate and full information.

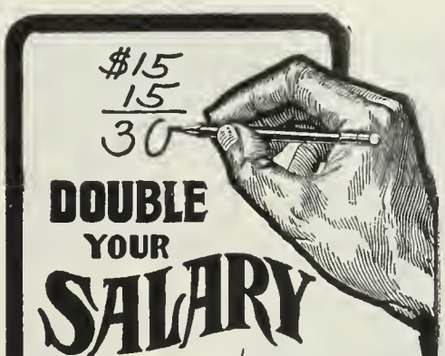
HOME INDUSTRIAL SCHOOL,
P. O. BOX 100, Canton, O.

An Established

Plumbing and Steam Fitting business, located in Western Iowa, in a town of 4,000 inhabitants. Water works, sewer, electric lights, gas. Eight manufactories using steam. Brick building. Is located in center of city. Main floor fitted for plumbing and steam fitting supplies. Basement for workshop. Will sell building with business. Only one other plumber in city. Have some good contracts to turn over. Good reasons for selling.

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FOR SALE.—Hardware business and good will of trade; long established. $10,000 to $12,000; town 50,000, central southern N. Y. On four trunk line railroads; is special opening for wholesale and retail business. Advantageous terms will be made with an immediate buyer. Address "HARDWARE BUSINESS," care *The Metal Worker*, New York.



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Box 968, SCRANTON, PA.

Muskegon, Michigan
WANTS INDUSTRIES

The Chamber of Commerce of Muskegon, Michigan, has a cash fund to be used to secure the location of reliable manufacturing industries. Among the factories now operating are the following:

Alaska Refrigerator Co.	260	hands
Standard Malleable Iron Co.	250	"
Central Paper Co.	180	"
Thayer Lumber Co.	250	"
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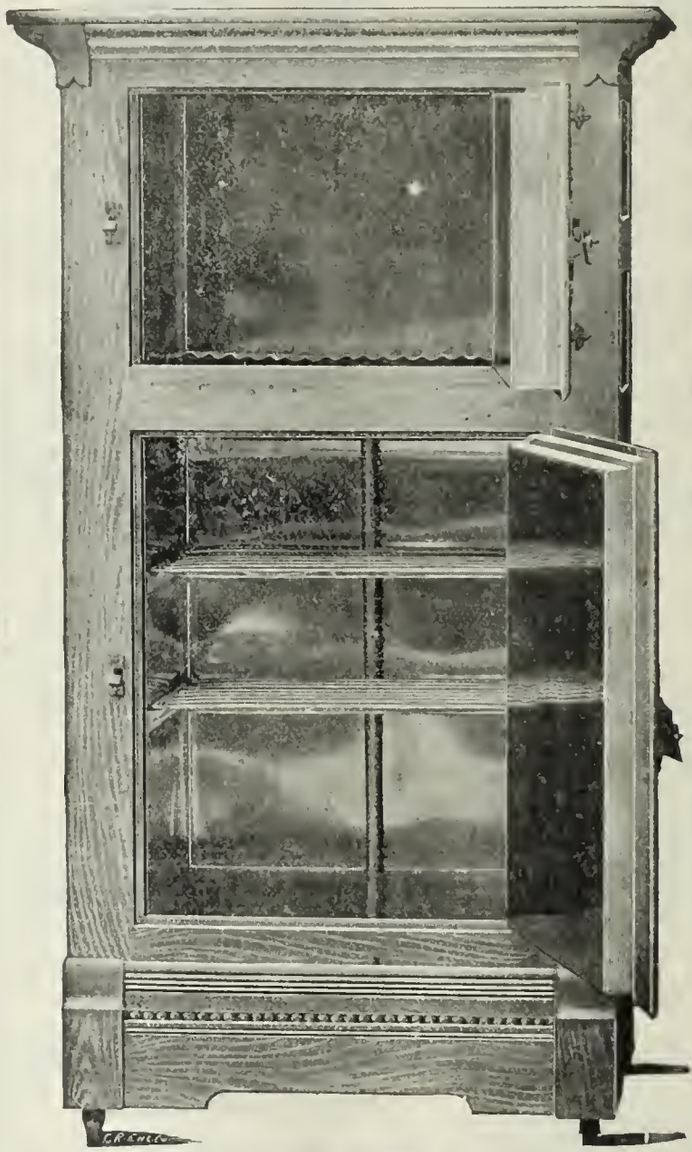
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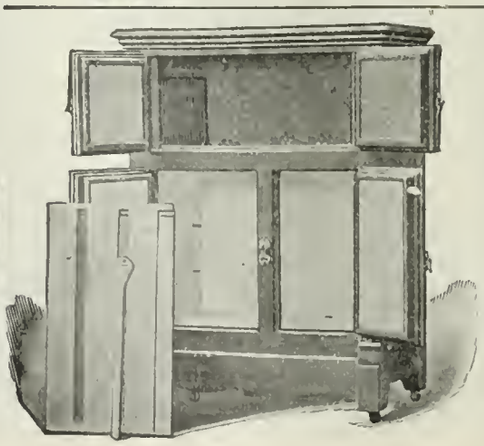
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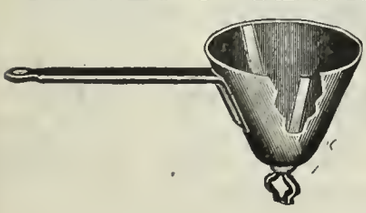
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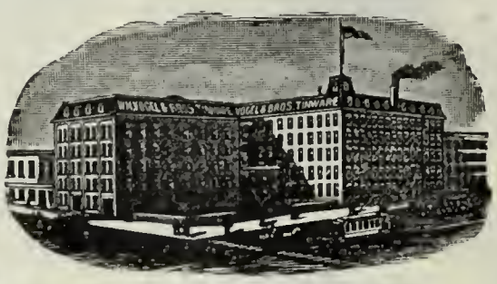
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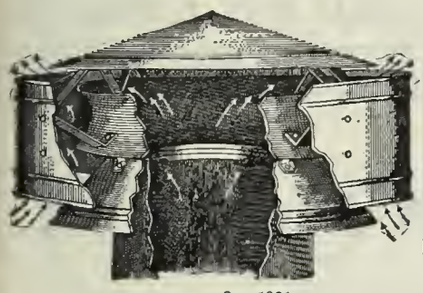
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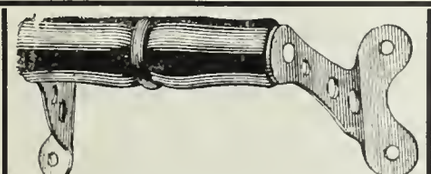
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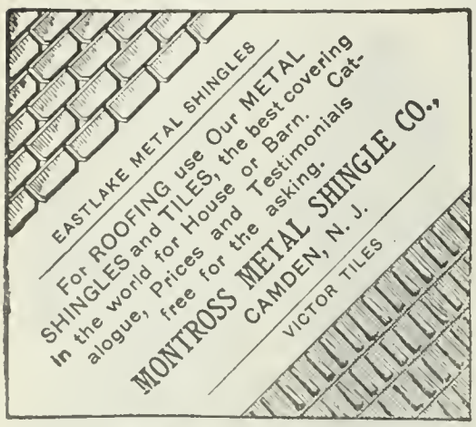
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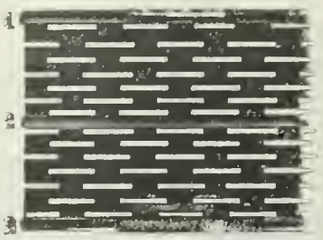
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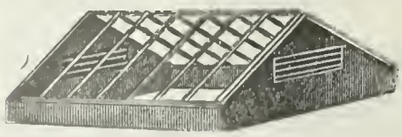
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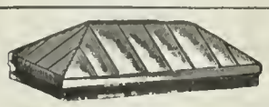
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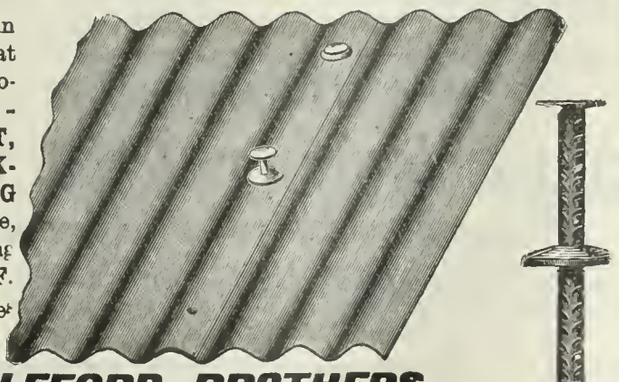
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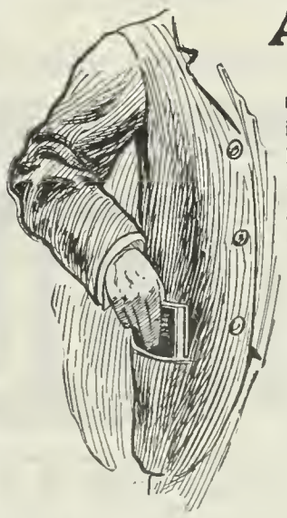
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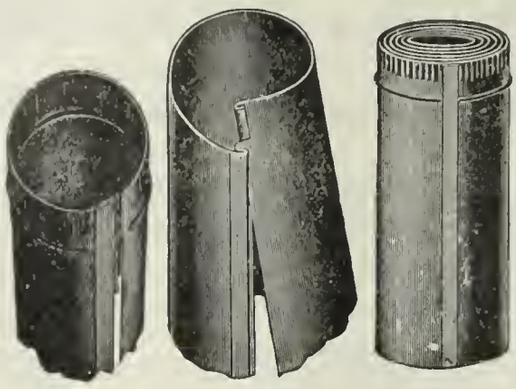
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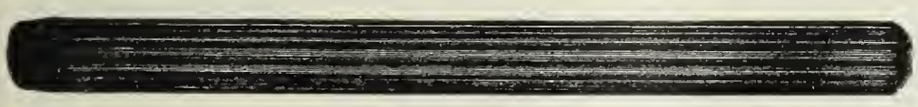
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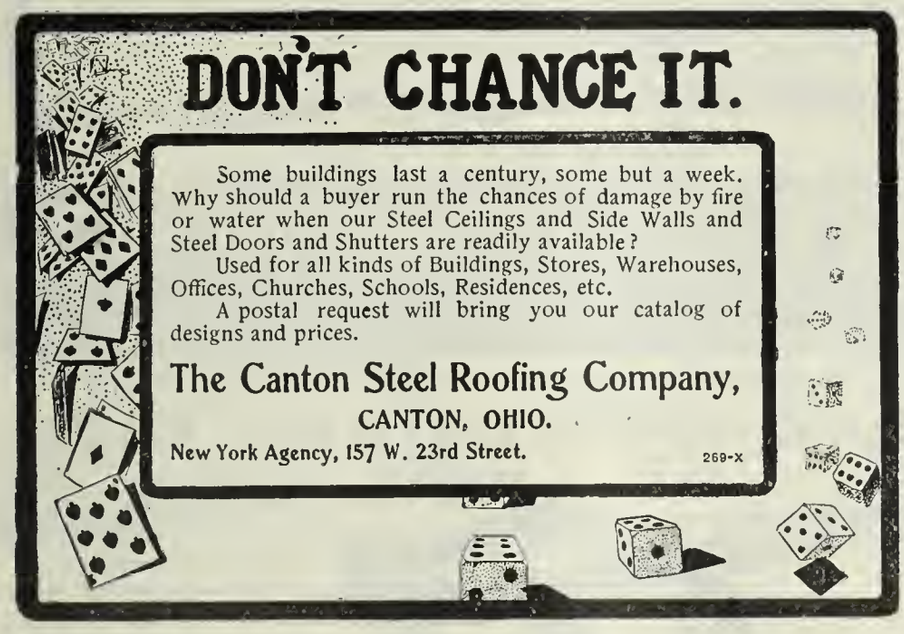
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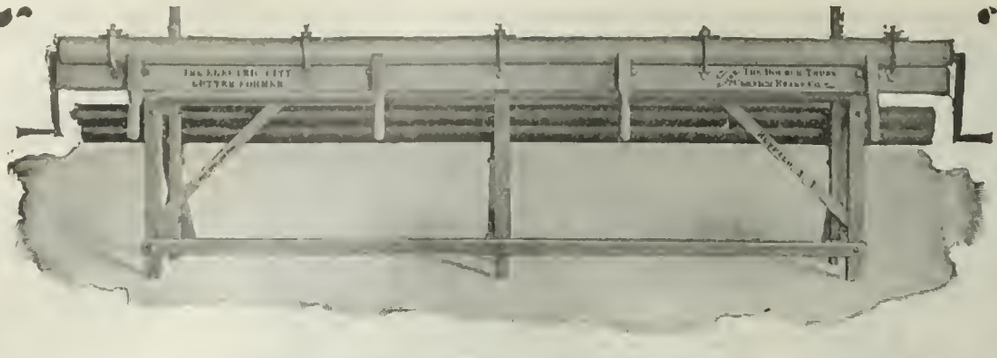
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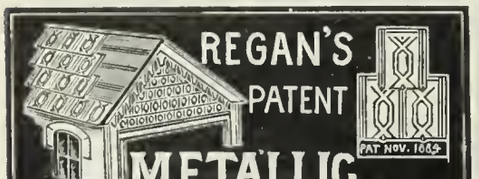
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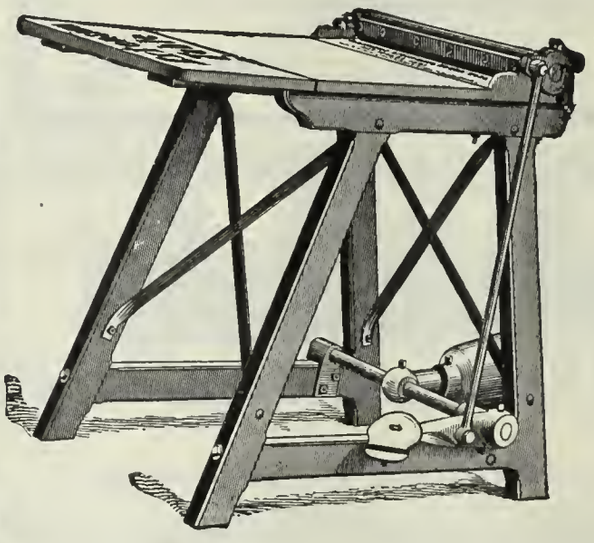
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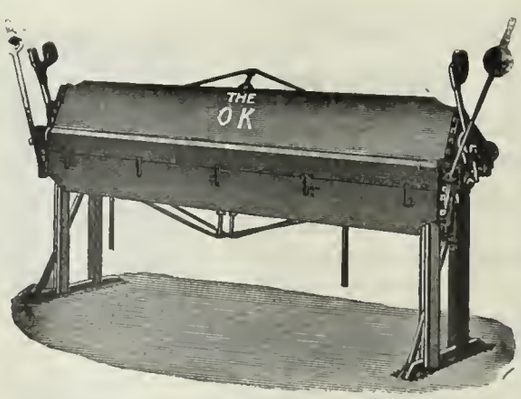
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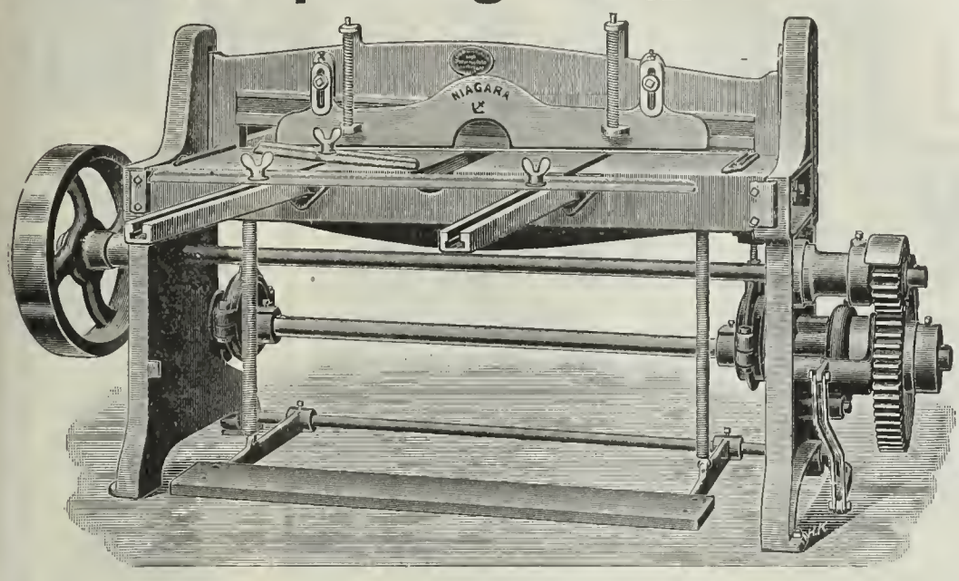
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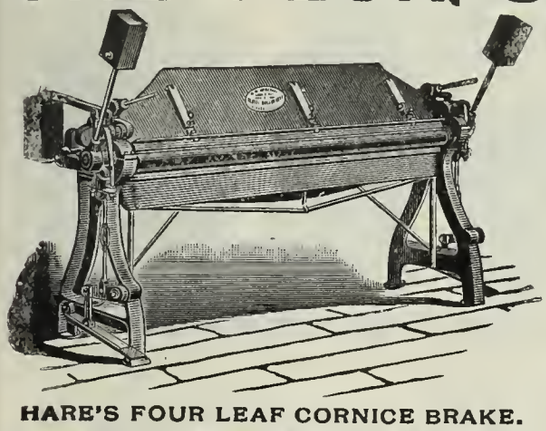


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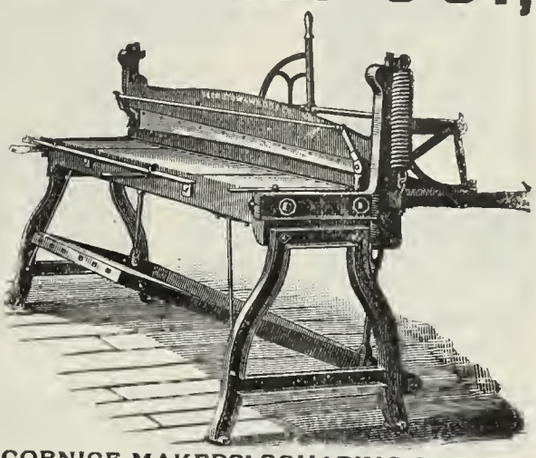


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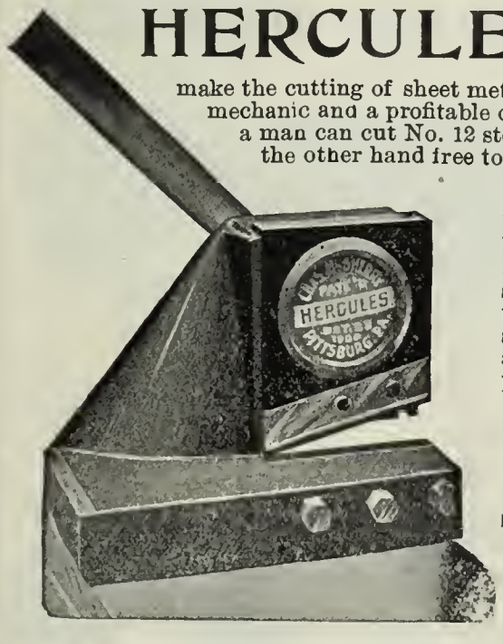
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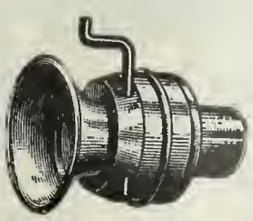
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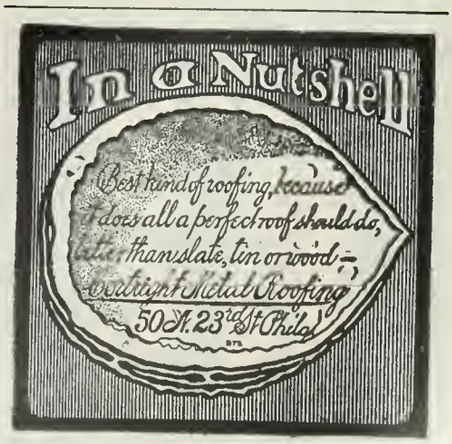


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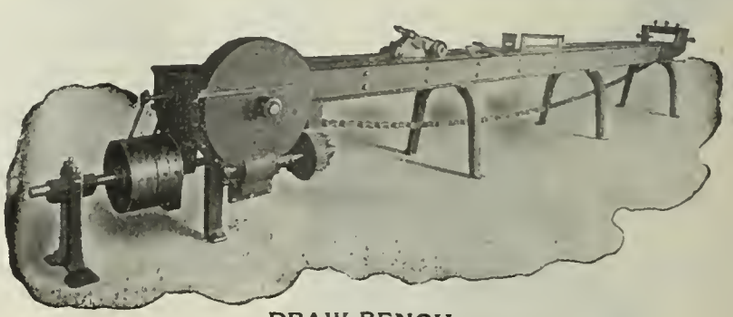
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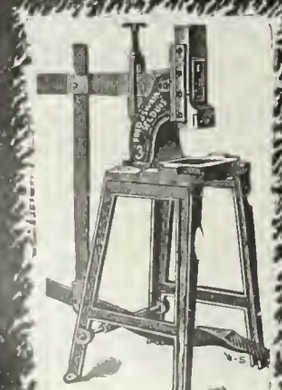
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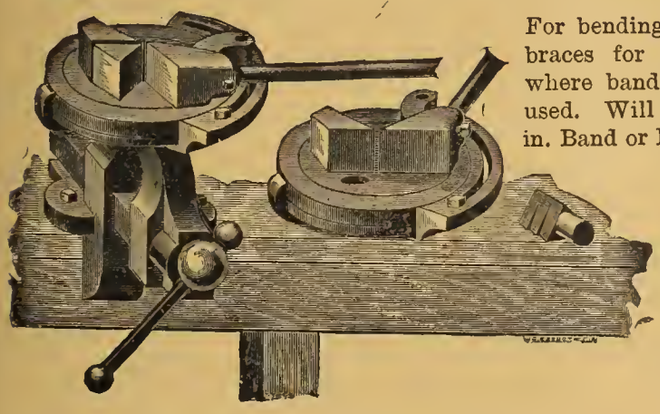
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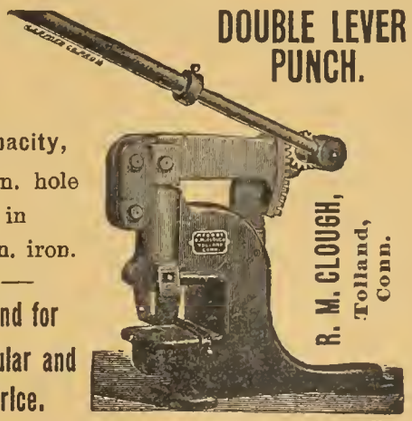
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"Well, he sent us 15 pounds of mincemeat."—*Baltimore American.*

— DIPLOMACY.—"Mamma, I wish you'd let cook put up my lunch instead of doin' it yourself."

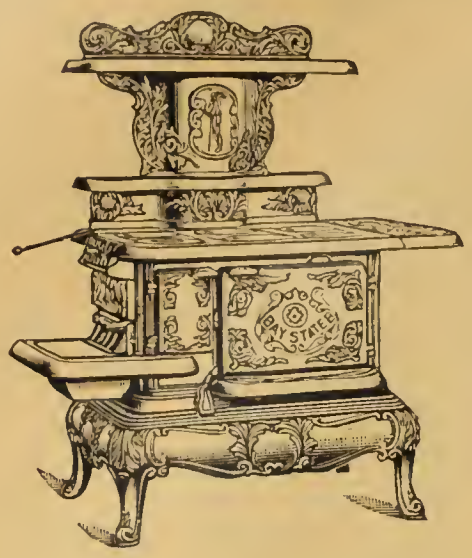
"It's no trouble, my dear."

"I know."

"Then why—"

"'Cause she's got a better appetite than you an' she puts more in."—*Moonshine.*

The New Bay State "B"



Will be the leader in **Range Society** the coming season.

It is artistic, thoroughly modern and right up to the minute in improvements of merit.

BARSTOW STOVE COMPANY,

BOSTON, 55 Portland St.
PROVIDENCE, R. I.
NEW YORK, Beekman and Water Sts.

It is assumed that **"Half and Half"** solder made of pure refined tin and lead is practically what should be used for all gen ral purposes. We make that kind. No one can make it any b tter than we do, as we have had the experience of over 60 years.

Be honest to yourself in buying a solder honestly made, and which you yourself can confirm by analysis.

N. & G. TAYLOR CO.,

MAKERS OF FINE SOLDERS,

PHILADELPHIA.

Established 1810.

FOR LODGE ROOMS.
Frink's Cluster Reflectors

In a great variety of styles and sizes, meet all the requirements of power, diffusion, and durability more perfectly than any other fixtures; they are consequently most economical.

I. P. FRINK, 551 Pearl St., New York.

L. & R. WISTER & CO.,

Bullitt Building, Philadelphia.

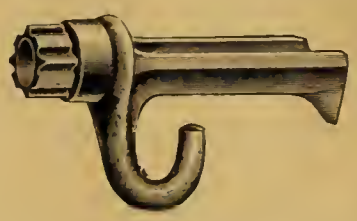
Dunbar Foundry Pig Iron.
Dunbar Connellsville Coke for Foundry Use.
American Sheet Iron Co.'s Sheet Iron.
American R. G., cleaned of uniform black color.
Dealers in all kinds of Iron and Steel Scrap.

BRUCE & COOK

TINNERS'
TOOLS and MACHINES

TINNERS' SUPPLIES

186, 188 & 190 Water Street,
248 & 250 Pearl Street,
NEW YORK.



Ideal Sap Spou

Are made open or closed, and a full line of other Maple Sugar goods. Send for dealers' price list.

CHARLES MILLAR & SON CO, Utica, N.

HUB RANGES

H
U
B

If you want the best line; the line with the **most attractive** and progressive selling features, l ok into the merits of the

Hub
Line of Ranges.
Steam and Water Heaters;
Hot Air and Combination Furnaces.

SMITH & ANTHONY CO., Boston.

In Stove Times

the far-sighted stove merchant builds a reputation, by making popular in his home town, ONE thoroughly reliable stove line. ONE that will be to him, because of its association, a constant source of profit in future years. That ONE should be

GLENWOOD

Write the Weir Stove Co., Taunton, Mass.

SOLDER

Our Various Brands:

ADMIRAL, FORT PITT, FREEHOLD

Are made from strictly New Metals and the Proportions Guaranteed.

McCLURE & CO.,

Manufacturers of Tin Plate,

PITTSBURGH, PA., 211, 213 and 215 Second Ave.

PHILADELPHIA, PA., 115 North 7th Street.

Index to Reading Matter, Page 59. Index to Advertisements, Pages 61-63.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

. LVII. BER 9. | NEW YORK AND CHICAGO, MARCH 1, 1902. | ONE DOLLAR A YEAR. SINGLE COPIES 5 CENTS.

WALWORTH MFG CO. TOOLS and SUPPLIES for STEAM WATER and GAS USERS BOSTON MASS

WALWORTH HEAVY PIPE VISE.



A first-class Tool for General Machine Work. Takes to 6-inch.

BOSTON, 128 Federal Street.
NEW YORK, Park Row Building.



The Gorton Side Feed Boilers

FOR STEAM AND HOT WATER HEATING.
INVESTIGATE FOR YOURSELF.
Send for Catalogue and Prices.

GORTON & LIDGERWOOD CO.,

96 Liberty St., NEW YORK. Old Colony Bldg., CHICAGO.
77 Oliver St., BOSTON. Prudential Bldg., ATLANTA, GA.



STOVE LININGS McLEOD & HENRY CO., TROY, N. Y.

AMERICAN STEAM and ALTITUDE **GAUGES,** POP SAFETY **VALVES.**

Heating Specialties. American Steam Gauge & Valve Mfg. Co., Bismark St., Boston, Mass., U. S. A.

A dealer who thinks he would like to handle Paragon Furnaces and Excelsior Ranges for a short time, and then go back to another make, would better not order any of our goods. If he once uses them he will always do so and the other goods will stand no more chance than a stump-tailed cow in fly-time. Here's what a dealer wrote us not long ago:

"I haven't used a furnace or a range other than the Paragon Furnace and the Excelsior Range for well nigh eight years."

ISAAC A. SHEPPARD & CO.

NEW YORK **PHILADELPHIA** **BALTIMORE**

POLLO BEST BLOOM GALVANIZED IRON.

'As good as Appollo''—this rticular lie doesn't do any harm; as old as Methuselah.

Does us good; and the public . If all the galvanized iron re said by maker and seller to be is good as Apollo,'' the lie would feat itself and advertise us.

nerican Sheet Steel Company, New York.

If you have a line of

P. P. STEWART

Goods on your sample fl.or, your fall trade is assured.
Quick sellers bring big profits.

FULLER & WARREN CO., Troy, N. Y.

This Ad. changes every week.

NOTICE.

Silver, Nickel Platers and Brass Goods Mfrs. MATERIAL FOR DRYING PURPOSES.

Write for prices to John Sommer's Son, 355-365 Central Ave., Newark, N. J.



CROSBY SPRING-SEAT

GLOBE and ANGLE VALVES, IRON and BRASS.

All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.

Crosby Steam Gage & Valve Co.,

BOSTON: 95 Oliver St. NEW YORK: 78 John St. CHICAGO: 21 23 W. Lake St.



JENKINS IMPROVED AUTOMATIC AIR VALVES.



Suitable for high or low pressure. Take no more room than an ordinary air cock. Endorsed by the leading steam experts as the best made and the quickest working. All genuine stamped with our Trade Mark.

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team Specialties.

LIEF and NOISELESS BACK
RVATOR VALVES, PRESSURE VALVES,
EAM TRAPS, PUMP GOVERNORS,
EAM AND WATER STEAM and OIL SEP-
DUCING VALVES, ARATORS
NK TEMPERATURE CONTROLLER and
A No. 1 DAMPER REGULATORS

KIELEY AND MUELLER,
17 W. 13th St., - NEW YORK.

FOLLANSBEE BROTHERS CO.,
328-330-332 Second Ave.,
Pittsburgh.
Galvanized and Black Sheets.

The Leaders:
Follansbee Pure Iron Old Style; made specially, having Charcoal Iron Base.
Also, Scott's Extra Coated, well known everywhere.
Samples on application.

Philadelphia, 133 Arch St.
Chicago, 504 N. Water St.
Louisville, 7th and Magnolia.

READ OUR "AD" Page 14.
MAGEE FURNACE CO.,
Boston.

ROUND OAK

STANDARD of AMERICA

We stand back of Round Oak specialties to the limit.

If any Round Oak fails to perform properly, or there is a fault in its manufacture, we spare no time nor expense to make it right.
We do not intend that any Round Oak specialty shall get away from Dowagiac imperfect.
Our system of inspection is the best we can devise—but, if it should happen, we protect the customer against loss.
We have another peculiarity also—we treat all customers alike. We have but one price.



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P. D. Beckwith

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MICHIGAN

Makers of Good Goods Only

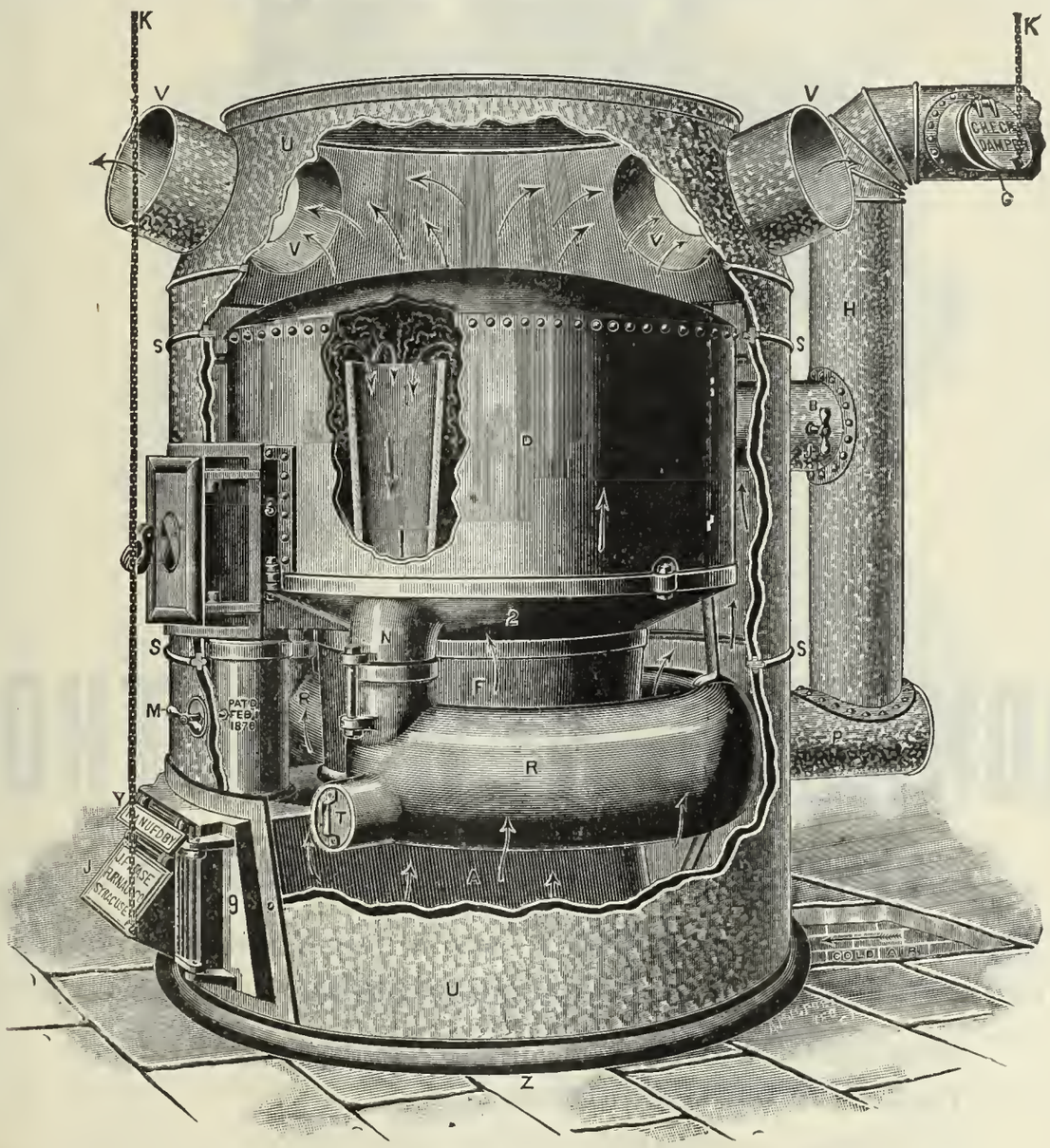
HB CHICAGO

MOST MEN WOULD RATHER BE FROZEN THAN BUNCOED.

PASTEBOARD HEATERS MAKE ENEMIES.

SELL GOOD GOODS.

The PEASE-ECONOMY
Low Down Furnace
IS RELIABLE.



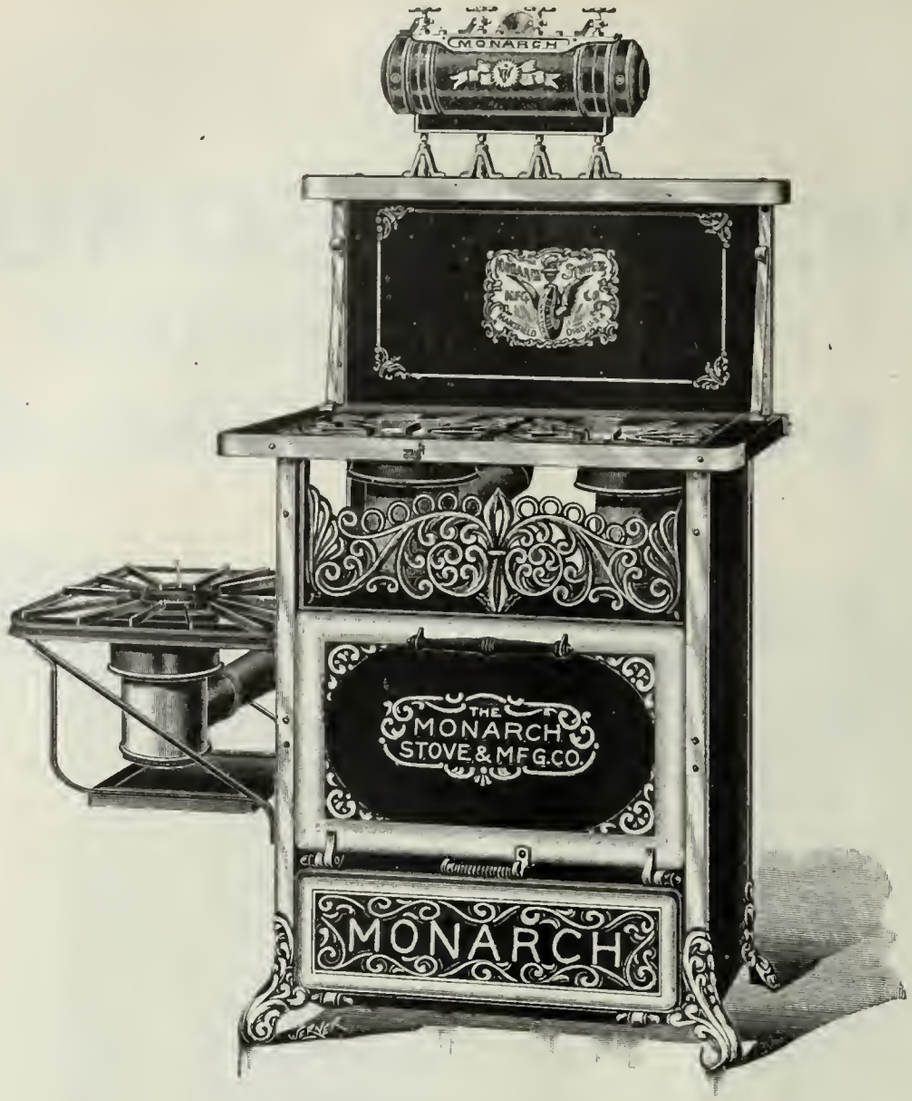
This Heater, in original and improved forms has been before the public for many years, and, so far as we know, has lived up to our representations in every instance. And

WE HIGHLY RECOMMEND IT.

INTERNATIONAL HEATER CO., Utica, N. Y.

BOSTON, NEW YORK, CHICAGO, DENVER.

LARGEST MAKERS OF HEATERS IN THE WORLD.



...THE...

MONARCH NEW METHOD

EVAPORATING GASOLENE STOVES

are ALL the other fellows claim and a few additional. They are the talk of the trade and make customers without and because of their

Striking Originality and Distinctiveness of Features.
Highest Grade Workmanship.
Attractive and Artistic Design and Finish.

ANY ONE OF WHICH ARE PROFIT PRODUCERS.

THE MONARCH STOVE & MFG. CO., Mansfield, O.

—BRANCHES—

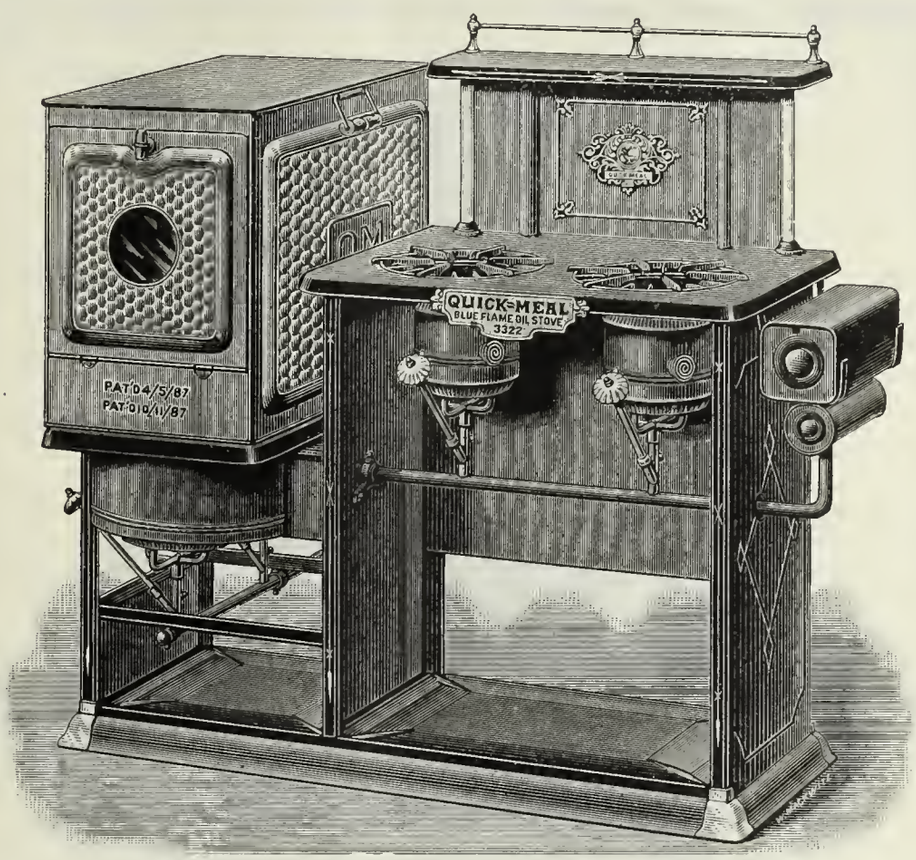
284-6 Pearl St., New York. 107 N. 2d St., Phila. 203 Wood St., Pittsburg. 67 Lake St., Chicago. 191 Eagle St., St. Paul, Minn. H. R. Bruce & Co., Cincinnati, Ohio. Central Supply Co., Des Moines, Iowa. Newby Stove Repair Co, Kansas City, Mo. Bartlett & Norris, Lincoln, Neb. W. H. Gruenhagen, St. Paul, Minn. M F. Stellwagen, in Wisconsin. Kellogg & Stokes Stove Co., Denver, Colo. R. P. Smith, Houston, Texas.

The trade in the various States covered by these Branches and Representatives will be given the very best service possible and their interests receive the most careful attention.

Have you a copy of the Catalogue? If not drop a postal to any of the above and it will come on the jump.

QUICK MEAL

Wickless Blue Flame Oil Stoves.



"Quick Meal" Blue Flame Oil Stoves are simple, durable and easy to regulate. Their perforated burner drums are stamped out of one piece of heavy steel. Their drip cups are also stamped and drawn out of one piece of heayv brass. These parts being made of one piece makes them strong and durable and leaves no creases for the dirt to gather in.

"Quick Meal" Blue Flame Oil Stoves have only one valve for each burner, which makes them simple and easy for the operator to understand. Their frames are strong and their design attractive. This makes them easy to sell. Catalogues are now ready. If you have not received one write for it.

RINGEN STOVE Co. SAINT LOUIS

YOU CAN DEPEND ON IT.

The Standard Wickless Blue Flame Oil Stove,

FOR COAL OIL OR GASOLINE.

The original and most successful Wickless Oil Stove.



That's what it is—The "Standard."—Standard in name, the Standard in quality, the Standard in perfect operation. Four years of continued success and it still leads. It's the Standard of excellence.

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FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.

PACIFIC COAST STATES.

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DOMINION OF CANADA.

THE THOS. DAVIDSON MFG. CO., · · Montreal, Quebec.

WESTERN JOBBERS.

COOK & VAN EVERA CO., Chicago, Ill.

MORLEY BROS. · Saginaw, Mich,

TOWNLEY STOVE CO., Terre Haute, Ind.

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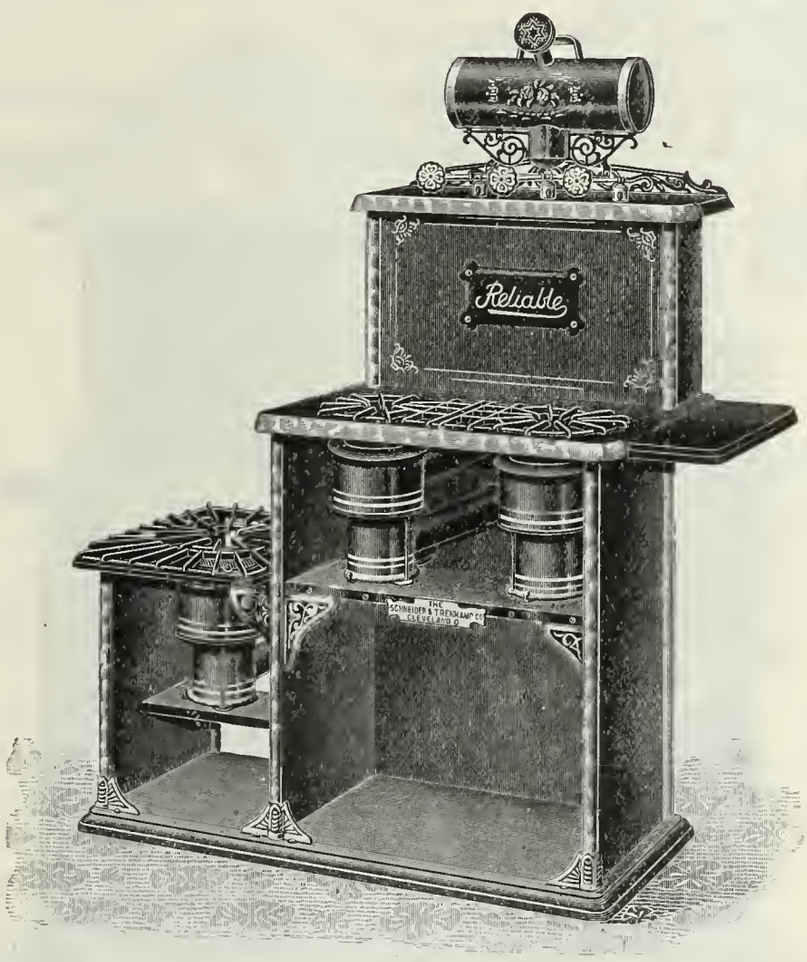
A. C. RAYMER, Omaha, Neb.

M. P. BORDEN STOVE CO., Denver, Col.

THE STANDARD LIGHTING CO., - Cleveland, Ohio.

Reliable Vapor Stoves and Ranges for 1902.

DEALERS who are seeking a strictly high grade line of Vapor Stoves and Ranges that are standard the country over cannot afford to overlook our line. "RELIABLE" Stoves have the NAME and FAME as being the best and most successful to handle.



THERE are NONE better. A few are claimed as good. None as well and favorably known. Our reputation will not permit of our making any inferior goods. If you wish to control the Vapor Stove business of your city, secure the agency of the "RELIABLE." They have proved profitable and satisfactory to thousands in the past, and will to you

Our line for 1902 is larger and finer than ever. Send for our latest catalogue. It is yours for the asking.

MADE BY

The Schneider & Trenkamp Company,

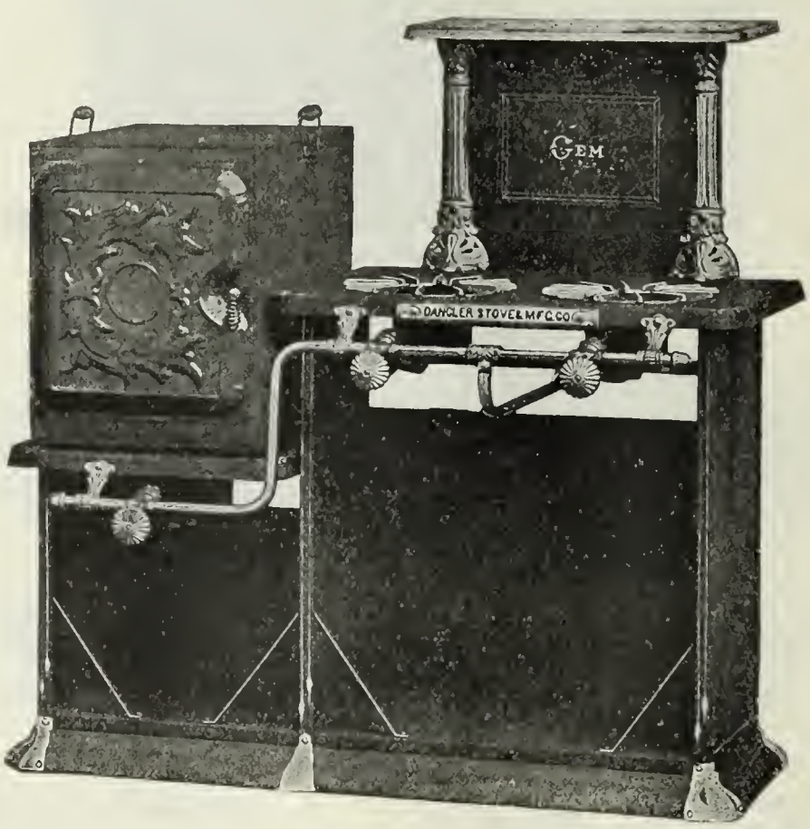
CLEVELAND. CHICAGO. SAN FRANCISCO.

THE DANGLER

For 1902 will put on the market a line of

Gasoline Vapor and Evaporating Stoves, Blue Flame Wick and Wickless Oil Stoves and also a line of Gas Ranges, Stoves, Hot Plates, etc. . . . . .

That for design, style and mechanical construction will not be equalled by any other make.



Our experience of 21 years in the manufacture of this line of goods,—being the oldest manufacturers,—justifies us in making the claim that our product has merits not found in other makes of Stoves in this line, notwithstanding that our lists, discounts and terms are the same as other manufacturers'.

All orders intrusted to us will have our careful and prompt attention. For further information we invite correspondence.

The Dangler Stove & Mfg. Co.,
Cleveland, Ohio, U. S. A.

STAR STOVES AND RANGES
ENTERPRISE STOVE CO. VINCENNES, IND.
GUARANTEED

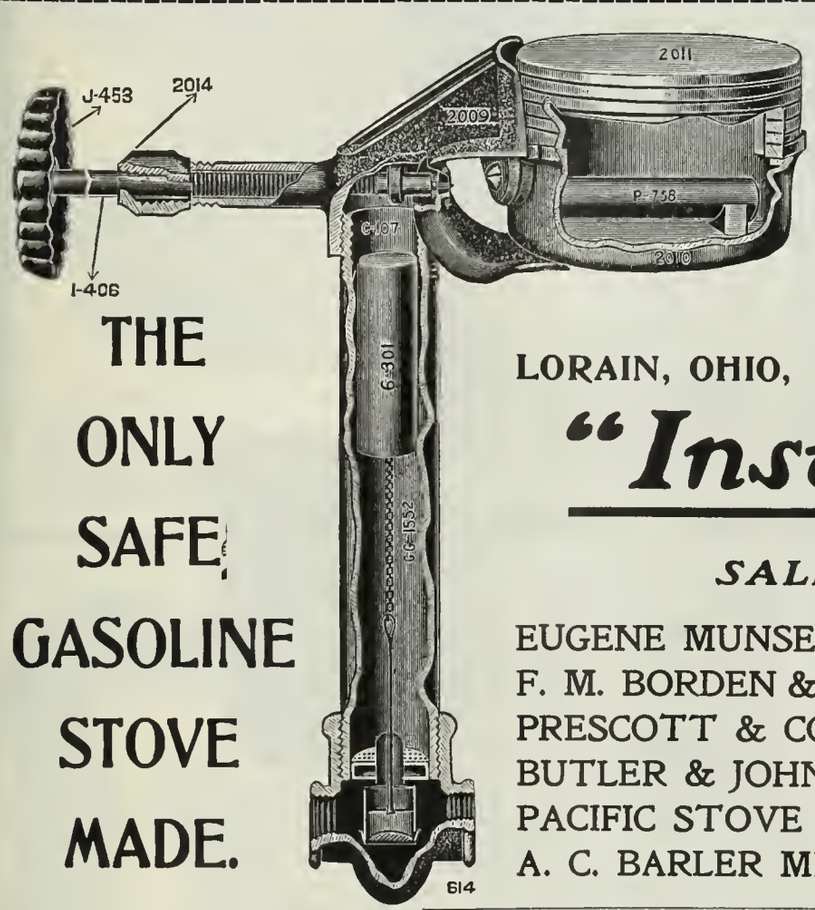
OUR CATALOGUE,

SHOWING

GAS RANGES
CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS

WILL BE FURNISHED FOR THE ASKING BY

Enterprise Stove Co., VINCENNES, IND.



NATIONAL STOVES

THE ONLY SAFE GASOLINE STOVE MADE.

LORAIN, OHIO, CHICAGO, 104 Lake St.

"Insurance"

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BUTLER & JOHNSON, - Syracuse, N. Y.
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HARPER & McINTIRE CO. For IOWA, NEBRASKA. KANSAS, MISSOURI.

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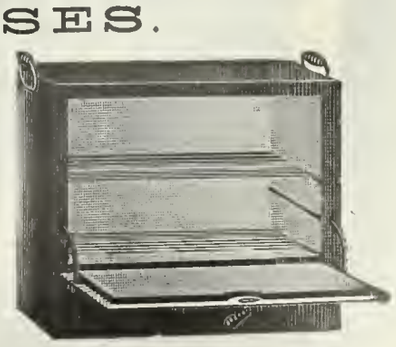
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Asbestos Lined Ranges and Ovens, Cookers and Hot Plates.

FOR ALL GASES.



Catalog No. 35 on application.

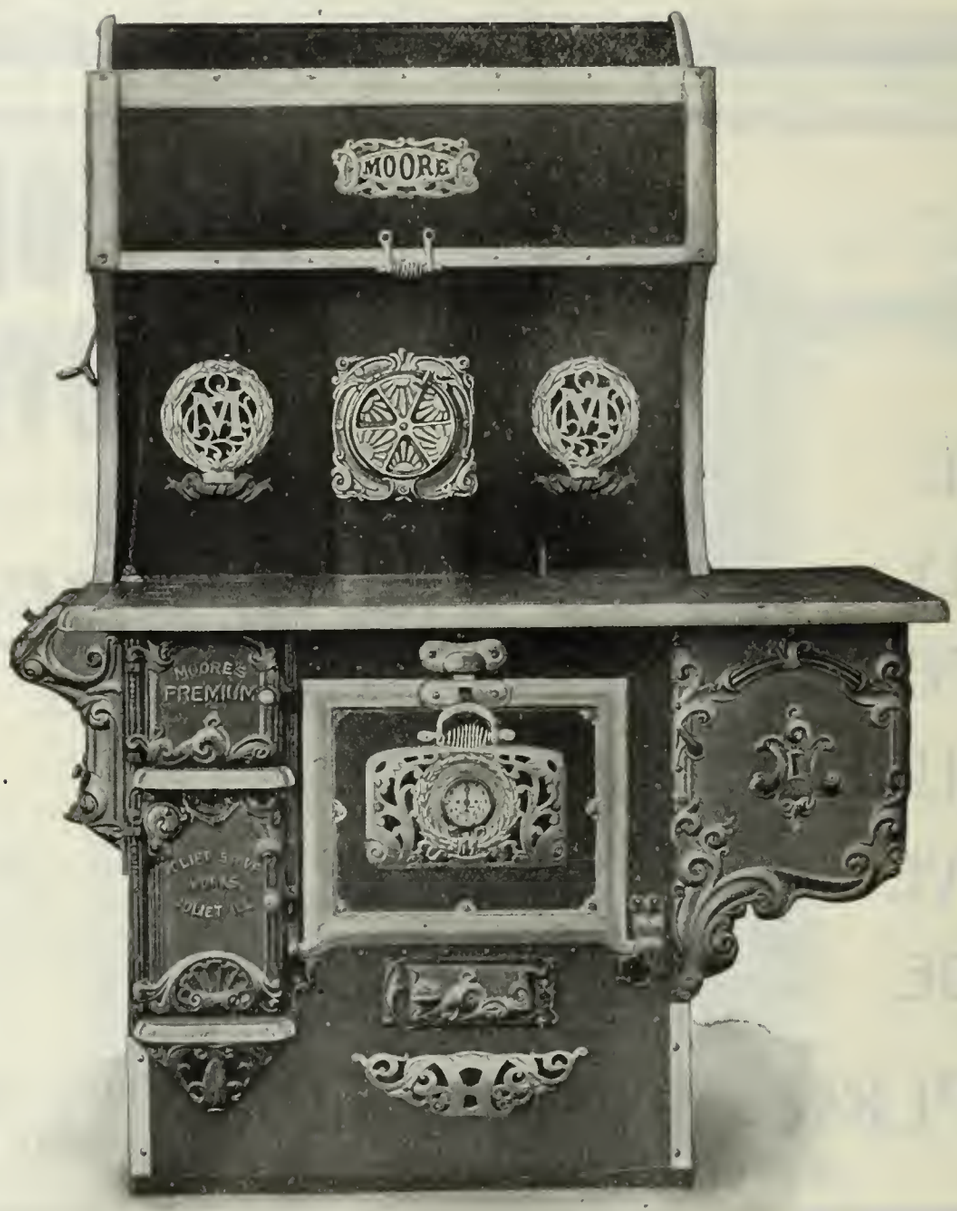


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PITTSBURG, PA.

HENRY WATERMAN, - - 195 Lewis St., N. Y., Eastern Agent.

Moore's Premium



There is a STYLISH ATTRACTIVENESS about

MOORE'S RANGES

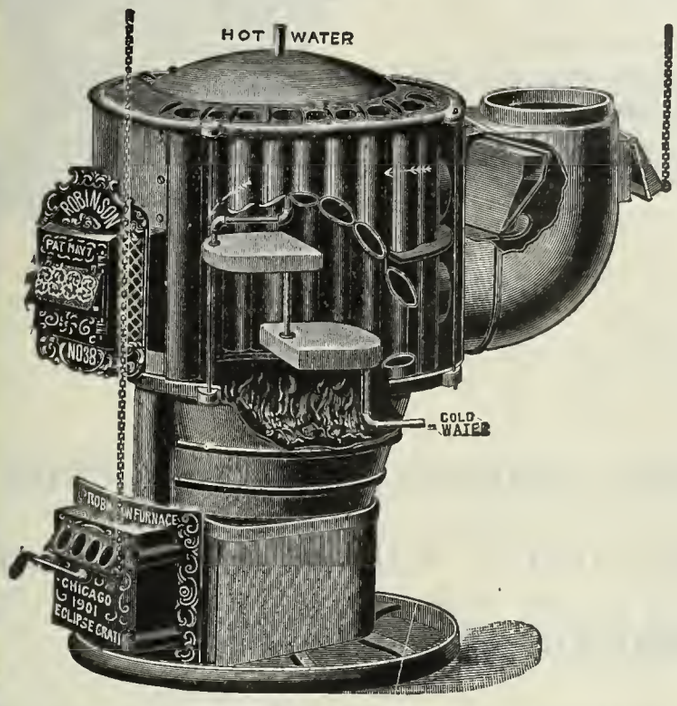
Which, added to their well-known record for doing good work and durability, makes them easily,

"The Easy Line to Sell"

JOLIET STOVE WORKS, Joliet, Illinois.

37

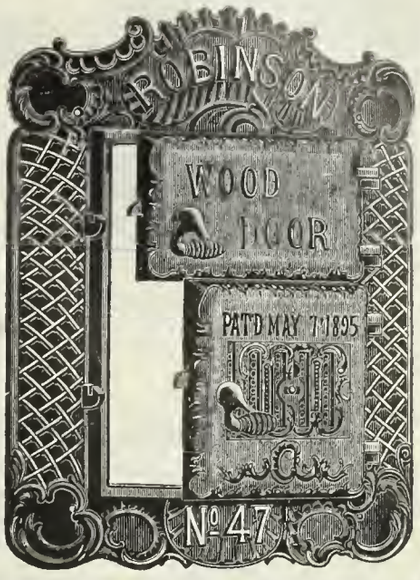
The Robinson Tubular Warm Air Furnaces



Robinson Tubular Furnace for Hard Coal.

are constructed to give the greatest amount of heat from the smallest amount of fuel. These furnaces contain many special features not found in other heaters. These features are original with us and are fully protected by letters patent.

Write for catalogue.



Double Doors on Robinson Tubular Furnace.

ROBINSON FURNACE CO., - Chicago, Ill.

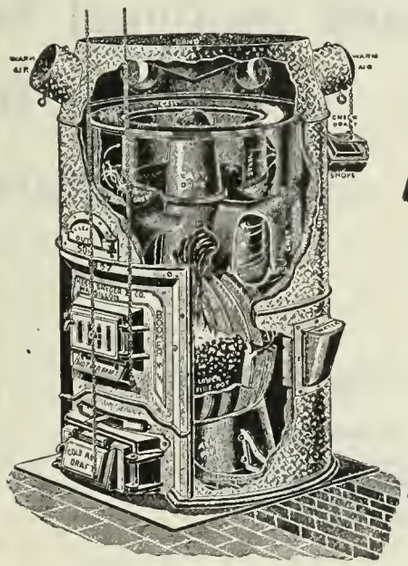
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REGARDING

Boomer Furnaces.

OR

Boomer Steel Ranges



Boomer Furnace.

We want to state in strongest terms possible that if you want the

HEAVIEST,
MOST DURABLE,
MOST ECONOMICAL

and easiest to take care of Furnace or Steel Range, buy a **BOOMER.**



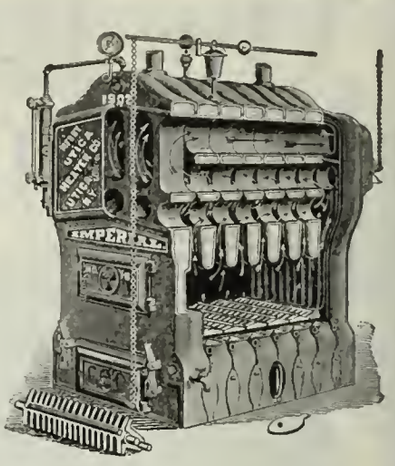
Boomer Steel Range.

Neither time nor money is spared to make them the Best.
Buy Boomers and save your coal bills.
We invite investigation.

THE HESS-SNYDER CO.,
Manufacturers, MASSILLON, O.



SUPERIOR Steel Furnaces.
SUPERIOR Heaters.
UTICA Heaters.
IMPERIAL Sectional Boilers.
IMPERIAL Round Boilers.
AUBURN Round Boilers.
Double Safety Furnace Pipe.
Heating Contractors' Supplies.



We are offering special inducements to dealers unacquainted with our lines, and it will be to your best interests to ask for our catalogue and prices

Our Furnace Catalogue illustrates and describes our complete line of Hot Air Furnaces---*11 DIFFERENT STYLES, 48 DIFFERENT SIZES*---for any kind of fuel, for any climate and for all possible requirements.

We also manufacture round and sectional boilers for steam and hot water heating. If you are in the market for goods in this line, ask us for circulars and quotations.

REMEMBER, we are not connected with any Trust, Combination or Association, and will quote you independent prices upon application.

We have something interesting to you. Write for it.

UTICA HEATER COMPANY, Utica, N. Y.

THE H.B.SMITH CO.,
WESTFIELD, MASS., U.S.A.

Catalogue furnished only upon application to

Heating Contractors, Engineers and Architects

64 Pages. Size 9 x 12 Inches.

INDIRECT RADIATORS

(16 STYLES)

PACIFIC COAST AGENTS

HOLBROOK, MERRILL & STETSON,
SAN FRANCISCO, CAL.

EUROPEAN AGENTS

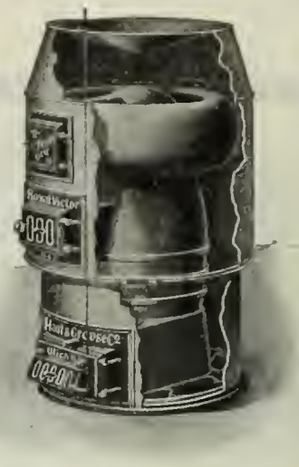
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BREMEN AND NEW YORK CITY.

SALESROOMS:

THE H.B.SMITH CO.,

133 CENTRE STREET.,
NEW YORK.

510 ARCH STREET.,
PHILADELPHIA.



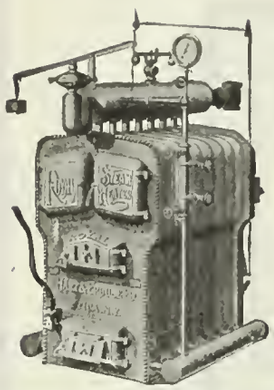
Royal Heaters.

HART & CROUSE CO.,

235 Water St., New York. 78 Lafayette St., UTICA, N. Y. 79 Lake St., Chicago.

The Leading Line of Heating Apparatus.

HOT WATER,
STEAM,
HOT AIR.



Be Careful, Mr. Contractor

You'd better be a bit careful when you're putting a heating plant into a customer's house. You're helping your reputation, or hurting it, in the easiest place in the world to do either.

If you don't make a good job of it your customer won't forget it.

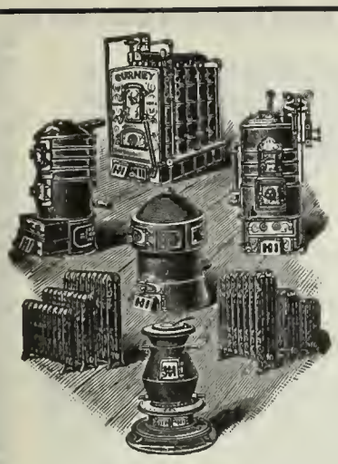
If you're not sure of the heating apparatus used he'll lay it up to you just the same.

You'd better put in a Warm Air, Steam or Hot Water Heater that there isn't the least question about—one that you know can be depended upon to do the work required of it, that you are sure will wear well, that you are certain will not be causing continual annoyance to its owner—and to you

You may be certain that a MAGEE Heater will never go back on you.

MAGEE FURNACE CO., 32-38 Union St., BOSTON

Steam and Hot Water Heaters, Warm Air Furnaces, Combination (Warm Air and Hot Water) Ranges, Stoves, etc.—Largest Line under one name in the United States.



Gurney Heaters

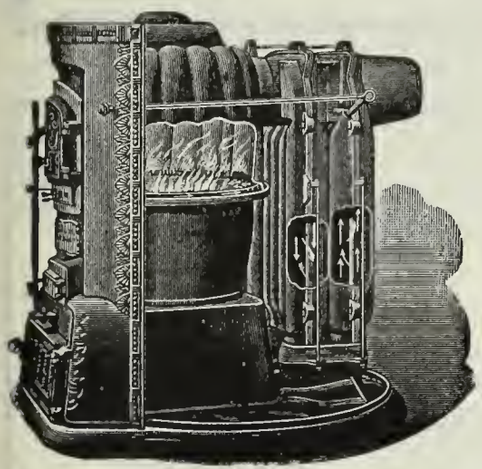
Provide every advantage a heater can provide,—the very best material, the most durable and approved construction, insuring the greatest efficiency from the least possible consumption of fuel.

CAPACITIES FULLY GUARANTEED.

Don't you wish to handle the BEST? Send for our latest trade catalogue.

GURNEY HEATER MFG. CO., 74 Franklin Street, Boston. 111 Fifth Ave., New York City.

Western Selling Agents, JAMES B. CLOW & SONS, 222-224 Lake St., Chicago, Ills.



Bengal Furnaces

ARE TRADE WINNERS.

Most powerful and compact furnace ever produced.—Over 3500 square inches radiating surface.—More than any other furnace their size.

ALL CAST IRON.

YOU NEED THEM IN YOUR BUSINESS.

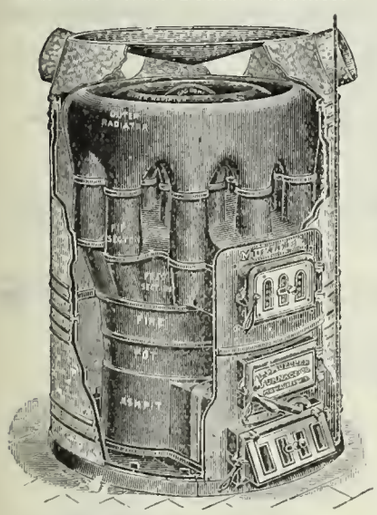
Secure a BENGAL AGENCY at once.

WRITE US FOR CATALOGUE AND PARTICULARS.

EASTERN SELLING AGENTS:
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Washington, Hanover and Elm Streets, Boston, Mass.

FLOYD, WELLS & CO., Royersford, Pa.

All Cast Iron Double Radiator.



Quality First

IS THE PRINCIPLE FOLLOWED

In the Manufacture of

MUELLER

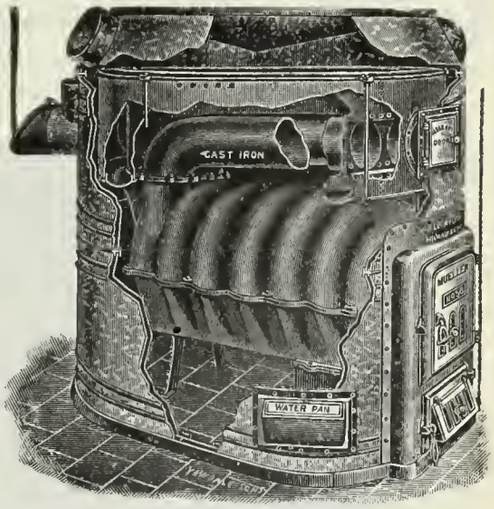
Furnaces and Boilers.

Made in all Styles—For all Kinds of Fuel.

Get Our Special Register Offer.

EVERYTHING IN THE HEATING LINE.

FOR WOOD.



190 Reed St., L. J. MUELLER FURNACE CO., Milwaukee, Wis.

REFRIGERATORS,
BLUE FLAME OIL STOVES,
GASOLINE STOVES.

LARGEST JOBBERS
in
NEW ENGLAND.

GAS RANGES,
FURNACES, STOVES,
RANGES AND REPAIRS.

HENRY N. CLARK CO., 56 and 58 UNION ST., Boston, Mass.

THE average manufacturer of Furnaces, when getting out a new Furnace, thinks it necessary to have special talking points; something different from his competitor.

Perhaps, if he works on it long enough and dwells upon the why and wherefore of some complicated flue construction, massive front, artistic ornamentation, he really believes he has the great and only best heater and coal saver that ever was, and wonders why you can't pay him extra dollars for it.

The average dealer has already learned a lot about theory; it's results that count.

Set a *"DIGHTON"* in the next house or same block of houses where there is a chance for fair comparison, ask your customer how many rooms are heated, how much coal was used, how many months he had a fire; if at the end of *one*, two, five or ten years your customer don't think the *"DIGHTON"* the best value of any furnace on the street, let us know about it.

Name, sentiment, theory or ornamentation don't count so much as results.

Compare *"DIGHTON"* results with any other Furnace, no matter what the price of it may be.

DIGHTON FURNACE CO., - - Taunton, Mass.

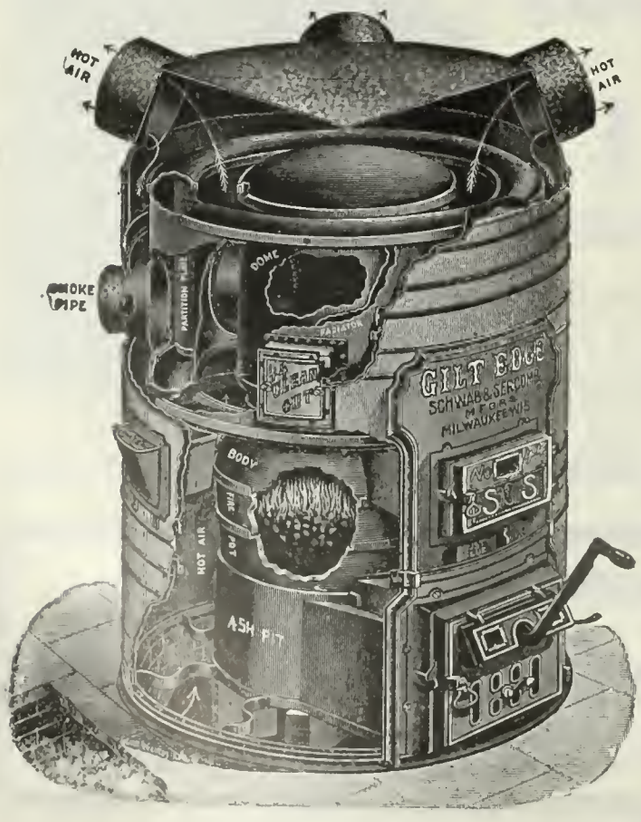
For a swell job

You ought to know our line—many a dealer loses an opportunity to make a good profit because he knows only heating stoves and furnaces.

We can post you concerning steam and hot water heating, so you can get a share of what is due you.

KEWANEE BOILER COMPANY

KEWANEE, ILLINOIS.



Gilt Edge Warm Air

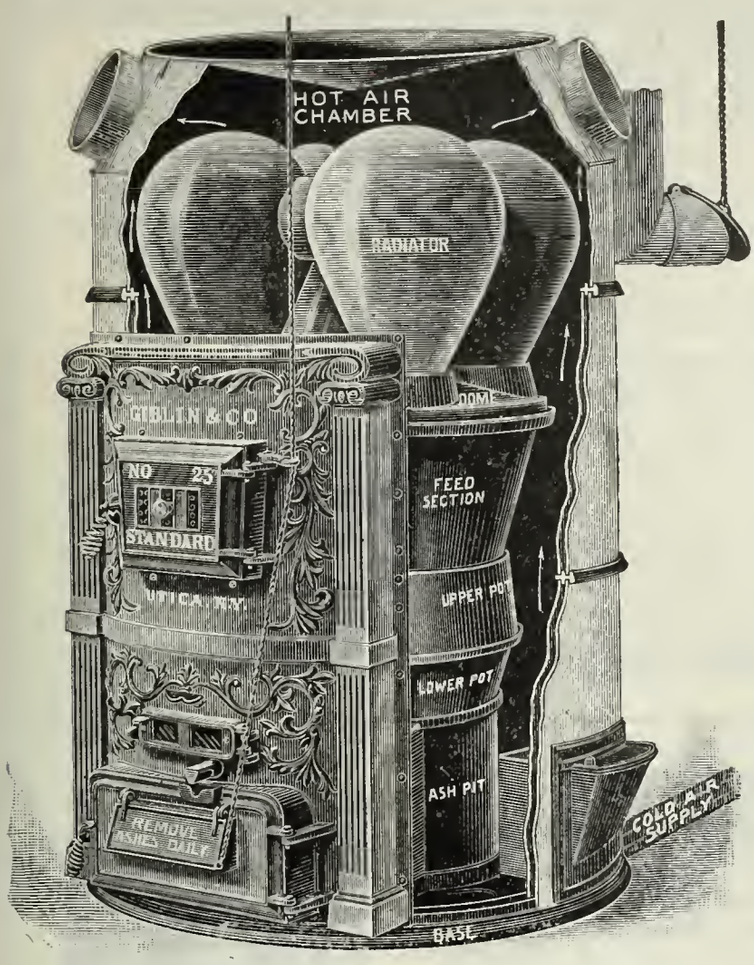
AND

Combination Heaters

have merits that are all their own. They are made in a large variety of styles and sizes, each adapted especially to a certain class of fuel. We are manufacturers of a complete line of Warm Air Registers, Safety Pipe and Tin Galvanized Iron Furnace Fittings.

R. J. SCHWAB & SONS CO.,

MILWAUKEE, WIS.



SECURING HEAT

without gas, smoke, or dust can be easily accomplished where the

Standard Furnace

is used. Observe construction of radiator. Four Domes and connection are made all in one casting with no joints whatever.

The form of this casting secures enormous

Radiating Surface

and the retention of the heated air. Eighteen years' experience has thoroughly demonstrated the efficiency of this

All Cast Iron furnace.

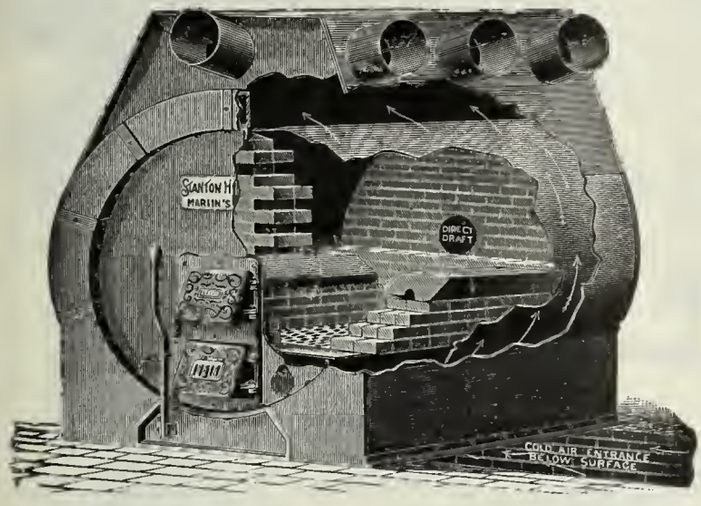
Dealers have continued to sell it for each of the 18 years with constantly increasing sales.

Send for Catalog and Prices.

GIBLIN & CO.,
UTICA, N. Y.

The Stanton Seamless Heater,

PORTABLE CASED.



LOUISVILLE, KY., Apl. 5th, 1901.

THE STANTON HEATER CO.,
Martin's Ferry, Ohio.

Gentlemen:—Your favor of the 3d inst. is received asking our experience with the Stanton Heater which you put in for us during the fall of 1899. In reply we will say that it gives us pleasure to express our entire satisfaction with this Furnace. While we have had no severe weather this winter there have been several quite cold snaps, but our offices have been very comfortably heated, and our coal bill (Pittsburgh coal) has been quite moderate compared with other Heaters we have used.

The satisfaction the Heater has given us can be best expressed by saying that we have not heard the Furnace mentioned once this winter. You can see, therefore, that we have had absolutely no cause for complaint.

Yours very truly,
ROBINSON-HUGHES & CO.

SEND FOR CATALOGUE.

THE STANTON HEATER CO.,
Martin's Ferry, Ohio.

See our advertisement next week.

IF YOU ARE NOT SELLING THE

Peck-Williamson Underfeed Furnace



you have not the trade and are not making the money you might. Just a pull or two of the lever feeds the new coal from underneath.

The Underfeed Furnace consumes less fuel than any other furnace ever built. The coal is burnt more slowly. All the heat units from it, as well as from the smoke, are utilized and all smoke eliminated.

Our handsome booklet explains its splendid heating qualities and coal saving.

You may have this booklet and our special plans for selling. Ask for booklet about our Laundry Dryer also.



THE PECK-WILLIAMSON COMPANY,
CINCINNATI, OHIO.

THATCHER RANGES LIKE THATCHER FURNACES ARE HIGH CLASS QUICK SELLERS.

MADE IN NEWARK.

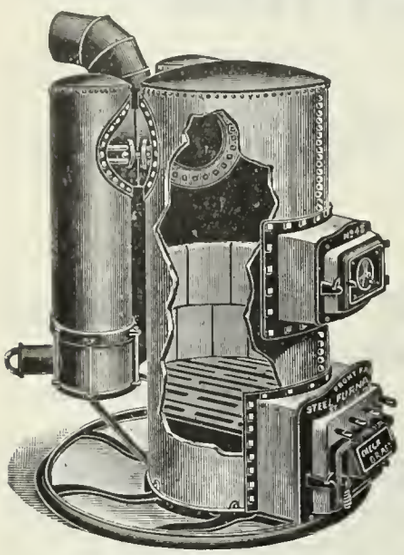
They are Durable and Very Economical!
They are Excellent Cookers and Quick Bakers!
They are Thoroughly Tested and Fully Guaranteed!

Thatcher Ranges Appeal to the Judgment of the Householder, and giving Full Satisfaction, are a Testimonial

TO THE DEALER.

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THATCHER FURNACE CO., 240 WATER ST., N. Y.



Front Rank Hot Air Furnaces

are built on vertical lines; air comes in direct contact with entire heating surface.

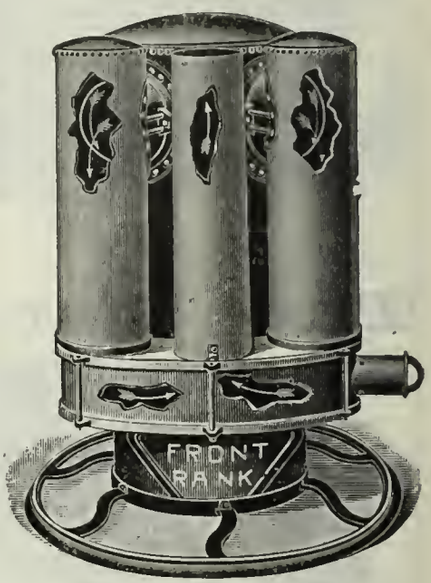
The Front Rank Fire Chamber is one solid sheet of closely riveted steel; being lined above the fire lines with genuine fire clay tiling it is the most durable made.

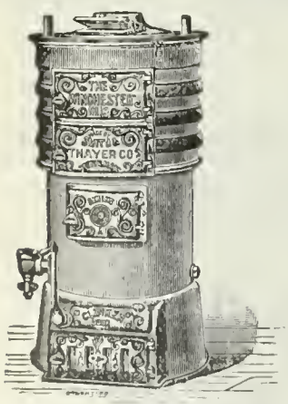
The radiators are very large and have an unusual area of heating surface in comparison with the size of fire pot.

These furnaces burn hard or soft coal or coke. We also make wood burning furnaces.

Send for our catalogue, it will give you a better idea of what we make.

FRONT RANK STEEL FURNACE CO.,
2301 to 2309 Lucas Ave., St. Louis, Mo.





WINCHESTER HEATER.

A boy who was asked why he was so tall for his age replied, "I really can't say, sir, because I am so busy I don't have time to tend to growing." It's about so with the demands for the "WINCHESTER" heater. It takes all our time to wait on present needs, yet each year sees greater demands on our time. Smith & Thayer Company, Boston, Mass., 106 Beekman St., New York.



BRAND STOVE CO.

STOVES, RANGES and FURNACES.
SEND FOR CATALOG.
MILWAUKEE, WIS.

Gurney

HOT WATER GENERATORS
HOT AIR GENERATORS
STEAM GENERATORS
RANGES *and* STOVES
REFRIGERATORS
STEEL RANGES
GAS RANGES
FURNACES

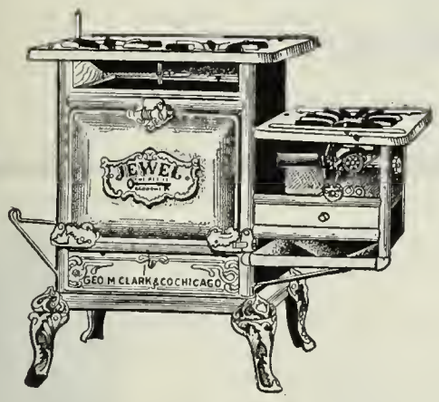
GURNEY AND COMPANY
WASHINGTON, HANOVER AND ELM STREETS
BOSTON, - MASSACHUSETTS

JEWEL GASOLENE STOVES



"Do not last."
"Wear out too quick."

If you do not believe it read the following letter.



W. W. MONTAGUE & CO.,
San Francisco. Los Angeles, New York.

Los Angeles, Feb. 11, 1902.
Messrs. George M. Clark & Co.,
72-76 Lake St., Chicago.

Gentlemen:

We are having some trouble with the JEWEL GASOLENE STOVES; THEY DO NOT LAST; THEY WEAR OUT TOO QUICK. A gentleman who lives in Los Angeles called to-day and got a rubber ring for a Jewel. Says he has used that stove continuously since 1888, and during that time has only had to buy one new generator.

Yours truly,
(Signed) W. W. MONTAGUE & CO.,
Per L. Kimble, Mgr. L. A. Branch.

We Made Stoves This Way 14 Years Ago.
We Make Them the Same Way Still.
Steel Ranges the 1902 Leaders.

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George M. Clark & Company,

Established 1881. **73 LAKE ST., CHICAGO, ILLS.**



Cinderella
Steel Ranges

REPRESENT

The Best Materials,
The Best Construction,
The Best Workmanship.

THEY ARE

The American Standard for Excellence.

ALL STYLES AND SIZES AT MODERATE PRICES.

We would be pleased to send our catalogue.

PITTSBURGH STOVE & RANGE CO.,
PITTSBURGH, PA.

WESTERN SALES AGENT,
W. D. Sager, 38 and 40 Michigan St., Chicago, Ill.



Emperor Furnaces

FOR WOOD.

Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces. . . .
Furnished for either Brick or Galvanized Iron Casing

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Bergstrom Bros Co.

NEENAH, WIS.



Common Sense Circulator AND Radiator.

A FUEL SAVER.

This heater is so simple that its superiority over all others is plain. Being open at each end, the cold air is taken in at the bottom, passing out heated at the top, producing a constant circulation unequaled by any radiator, is easily cleaned out and if necessary can be repaired by any tinner. Takes the place of a joint of pipe 6 or 7 inch, outer casing 10 and 12 inches in diameter. Made of Wood's Refined and American Russia Iron. Can be used on pipe in back of stove, or room above, with any kind of fuel. It is the best heater made. Patronage of Stove and Hardware Jobbers solicited. If the house you buy of cannot supply you send direct to me. I am not looking for Department Store or Mail Order trade. Patent applied for.

Manufactured by

A. C. SELLECK,

755 to 757 W. Madison St., - - - CHICAGO, ILLS.



Save Your Shipping Tags.

Return 200 of our special **IDEAL PREMIUM TAGS,**—attached to all repair orders, shipped or delivered, and receive **free, a 1000-mile mileage book** on any railroad within that distance of Philadelphia or Baltimore.

Write us for further particulars and plan.

STOVE REPAIRS OF ALL KINDS, STOVES, HEATERS AND RANGES.

CHAS. C. HEATH & CO.,

Baltimore and Philadelphia.

Practical Hints on Joint Wiping,

FOR BEGINNERS IN PLUMBING.

SIXTH EDITION, ENLARGED.

With forty-one illustrations; 66 pages. Paper, 25 Cents.

This book contains a reprint from *The Metal Worker* of two articles on the method of joint wiping, an operation calling for a very large degree of manual skill. The first account is written by a practical plumber, and is illustrated from photographs representing the hands and tools when wiping joints in various positions. The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners. Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used. The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

Sent, Post-paid, on receipt of price, by DAVID WILLIAMS CO., - Publishers and Booksellers, 232-238 William Street, N. Y.

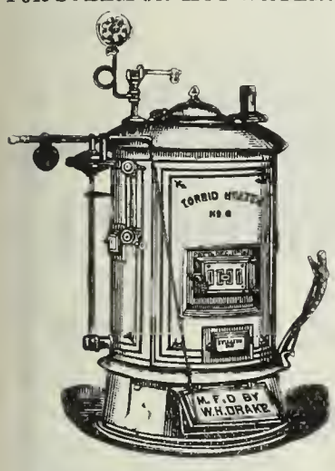
STAMFORD FOUNDRY COMPANY

MAKERS OF

RANGES COOKING AND HEATING STOVES
HOT-AIR AND COMBINATION AIR AND
WATER FURNACES
LAUNDRY STOVES CONFECTIONERS' STOVES
CABOOSE RANGES ETC ETC

STAMFORD CONN

"TORRID HEATER."
FOR STEAM OR HOT WATER.



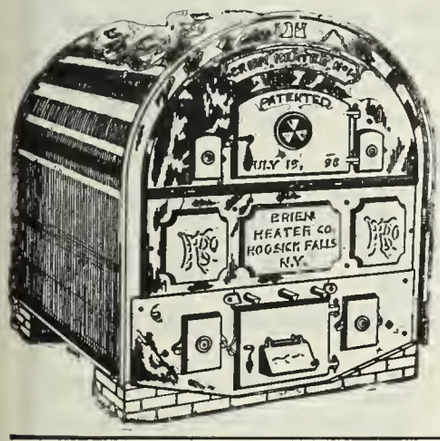
It is Practical in Design.
It is Safe, Being Tested to 200 Pounds.
It is Easy to Manage and Keep Clean.
It is Durable.
It is Sectional and Easily Handled.
It has No Packed Joints.
It is Self-Feed or Surface Burning.
It has the Torrid Patent Rocking and Dumping Grate.
It is Low in Price.

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MANUFACTURED BY

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Factory: Hackettstown, N. J.



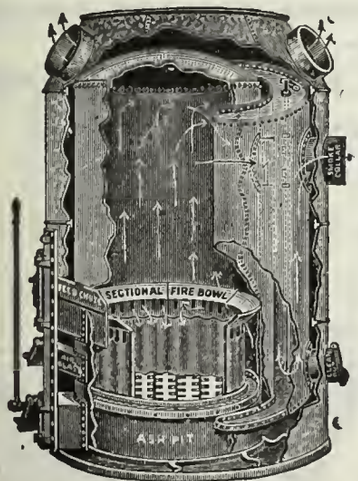
Brien Heater.

A perfect, all cast WOOD or COAL burner. There is no other Hot Air Furnace as low down as the "BRIEN."

Write for territory, catalog and prices.

BRIEN HEATER CO.,
HOOSICK FALLS, N. Y.

The Torrid Zone Furnace



is a trade winner because it has points of merit peculiar to itself that can be found in no other steel furnace. Our new catalogue is now ready to mail and a description of our Hot Air and Hot Water Combination Furnace can be seen in it. We furnish either the cast iron lining or the fire brick at the same price. Our Wood Furnace is called a powerful heater by those who use it.

CATALOGUE FREE.

Lennox Manufacturing Company,
Eighth Ave. and Frederick St.,
MARSHALLTOWN, IOWA.

HOT WATER AND HOT AIR



HEATING BY COMBINATION STOVES AND FURNACES.

Suitable for Large or Small Houses, Stores, Conservatories, Barber Shops, Hotels, etc., etc.

Heat Water Quickly.
Circulation is Positive.
No Joints Inside to Leak.

THE NATIONAL PIPE BENDING CO
160 RIVER ST., NEW HAVEN, CONN.



THE SUN AND RICHMOND
HEAT THE WORLD.

RICHMOND
HEATERS

ARE EFFECTIVE IN ALL KINDS OF WEATHER.

POWERFUL, ECONOMICAL, AND EASY TO REGULATE.

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NORWICH, CONN.

SCRANTON CORUNDUM & EMERY WHEEL CO.
1311-1315 Capouse Avenue, SCRANTON, PA.
Write for Catalogue.
OUR "BLACK DIAMOND"
artificial abrasive wheels are especially adapted for
The Stove Trade
THEY ARE THE BEST.

Pierce

BOILERS and RADIATORS

for Steam and Water Heating.



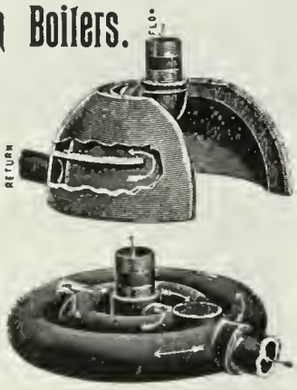
Pierce Touraine Steam Boiler.

LARGE HEATING CAPACITY.
ECONOMIC IN FUEL CONSUMPTION.

Endorsed by the foremost Architects and Heating Engineers.
Write for New Illustrated Catalogue.

Pierce, Butler & Pierce Mfg. Co.,
Syracuse, N. Y.
New York. Boston. Philadelphia.

The Champion Hot Water Combination Boilers.



They Fit Any Furnace.

Base section when used without ring sections.

Ring Section.

These Boilers are made in three sizes diameter, and from 100 to 600 square feet radiation capacity.
Will heat those cold rooms, or an addition to the building. Will increase the capacity of any furnace. Are cheaper than coils and will do more work.
Write for new circular. Manufactured by

FRANK D. STOLZ,
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WE don't expect you to buy Independent Registers unless it is to your advantage. But let us quote our prices.

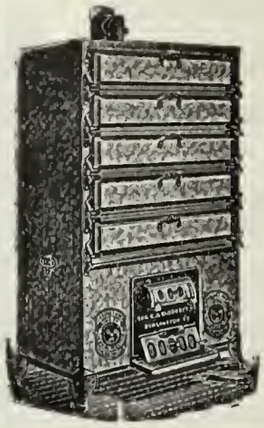
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152 Champlain St.
CLEVELAND, O.

Vance Boilers.



The most economical Steam and Hot Water Boiler on the market. Write for Catalogue and Price List.

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CABINET PORTABLE OVEN.

OUR LATEST PRODUCTION.
BAKES EVENLY BY THE CIRCULATION OF HOT AIR.
FOR BAKERS, CONFECTIONERS, HOTELS,
Also the best oven for Core Baking, Japanning, Enamelling, etc.

Made in six sizes, single and double, for coal, wood, natural or artificial gas.

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Champion and Marquart

Double Flue Ranges.



Only Double Flue Ranges in the Market. The Greatest Fuel Saver. Draw-Out Grate.

Handsomely Finished Throughout. Prices Within Reach of all.

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Palmer Hdw. Co., Savannah, Ga.

J. M. Litchfield, New York, N. Y.
Kettlesen & Degetau, Chihuahua, Mex.
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20th Century Gas Stoves

THE BEST GAS STOVE MADE.

Best Materials and Workmanship. Prices Low. Mail Orders Promptly Filled.

STOVE REPAIRS IN STOCK
FOR 2,000 STOVES AND RANGES.

Write for Prices.

THE METROPOLIS SHEET METALS AND STOVE REPAIRING CO.,
261-261½ Springfield Ave., Newark, N. J.

MICA

EUGENE MUNSELL & CO.
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Stove Dealers

will make money and save money by using

Dixon's Graphite Cement.

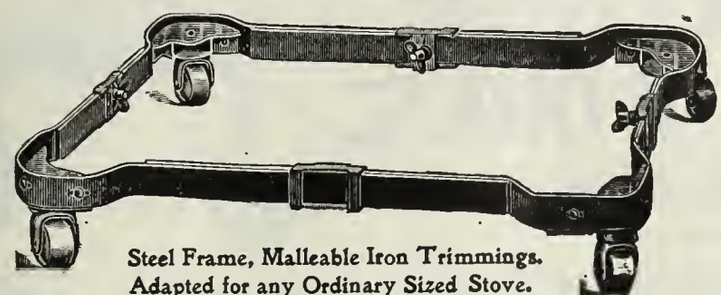
There is nothing equal to it for repairing fire brick in stoves, furnaces, etc. Let us send you sample and prices.

JOSEPH DIXON CRUCIBLE CO., - JERSEY CITY. N J.

The Standard Adjustable Stove Truck.

FINISHED IN BLACK ENAMEL.

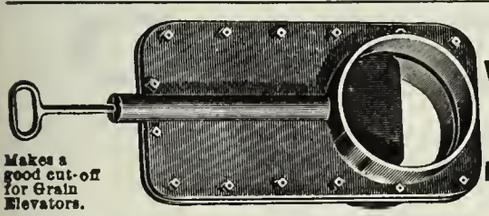
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Steel Frame, Malleable Iron Trimmings.
Adapted for any Ordinary Sized Stove.

Manufactured by **ARCADE MANFG. CO.,** - **Freeport, Ill.**



Makes a good cut-off for Grain Elevators.

IMPROVED WIND-GATE

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FOR STOVES AND HEATERS.

First-class in wood and iron.

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ORIGINAL, ARTISTIC AND PRACTICAL CONSTRUCTION.

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Prepared expressly for the Stove and Hardware Trade.

Two Grades: "North Carolina" and "Nevada."

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MICA

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OHIO MICA CO., CANTON, OHIO.

FOR MICA

Sheet, cut or uncut, Powdered and Flake,

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ASHEVILLE, N. C.

STOVE BANDS —AND— RINGS.

SPECIAL TUBING.
Cut to Length and Plated.

FLAT STRIPS & CORNERS.

SPECIAL
PUNCH PRESSWORK
SOLICITED.

Quality and Finish the Best.

The Kirk Manufacturing Co.,
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The "A B C" Blast Gates.



Simple, Effective,

For closing pipes in exhaust, blast and heating systems.
Send for price list.

American Blower Co.,
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New York. Chicago. London.

Furnace Heating.

A Practical and Comprehensive Treatise on Warming Buildings with Hot Air, by William G. Snow, with an Appendix on Furnace Fittings. 170 pages; size, 6 x 9 inches. Cloth bound. Price, **$1.50.**

This is the only book that has been brought out which presents a systematic and reliable treatment of the warm air furnace system of heating.

It deals with the various types of furnaces, their construction, proper location and setting, together with furnace fittings, and all matters pertaining to the installation of furnaces and to effective and economical heating by warm air. The subject is discussed for the first time by a competent author possessed of a scientific education and a practical training, who presents positive rules, based on a long experience, for guidance in designing furnace systems for dwellings and other buildings where this popular method is employed. The various details of furnace work are described simply and at such length that the volume will be valuable to all who are in any way interested in the subject. It is recommended to practical furnacemen, to architects, builders and house owners, and to tinners and plumbers in suburban sections who do furnace work. To all these it will prove a reliable text-book and guide.

PARTIAL SUMMARY OF CONTENTS BY CHAPTERS.

Chapter I.—Furnaces—Is devoted to Furnace Construction—The Relative Proportion of Furnace Parts—Secondary Heating Surface—Economy and Efficiency—Heating Capacity and Exposed Wall Surface—Manufacturers' Ratings of Their Own Productions, etc.

Chapter II.—House Heating—Compares Furnaces and other apparatus, and describes Method of Setting Brick and Portable Furnaces—Location and Area of Cold Air Supply—Cold Air Rooms and Air Filters—Return Ducts and Air Circulation—Size of Hot Air Pipes—Location of Registers, etc.

Chapter III.—The Combination System—Discusses Heating Distant Rooms with Radiators—Balancing the System—Location of Water Heater in Furnace—Capacity of Water Heaters—Size of Radiators, etc.

Chapter IV—Air—Deals with the Necessity of Ventilation—Water Needed to Moisten Air—Expansion of Air—Velocity of Air in Tubes, etc.

Chapter V.—Heating and Ventilation of Buildings—Considers the Size of Furnaces Required—Fresh Air Room and Supply—Air Circulation—Size of Flues—Use of Stack Heaters—Size of Heating Coils in Vent Flues, etc.

Chapter VI.—Heating of Public Buildings, Churches and Stores—Is given to the Size of Furnaces Required—Grate Surface in Ventilated Buildings—Air Supply—Size of Heating and Ventilating Flues—Size of Stack Heater, etc.

Chapter VII.—Fan-Furnace Combination System—Is devoted to Positive Warm Currents from Fan Systems—Location of Fan and Driving Apparatus—How Good Furnaces are Aided by Fans—Types and Efficiency of Fans—Area of Ducts and Flues, etc.

Chapter VIII.—Temperature Control.

Chapter IX.—Estimate and Contract Blanks.

Chapter X.—Value of Fuels. The Proper Size for Furnace Chimneys—with tables.

APPENDIX.

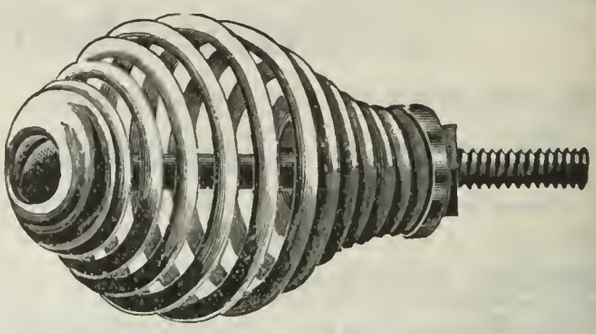
Furnace Fittings.—A section of 45 pages dealing with the Making of Furnace Casings—Metal Cold Air Boxes—Making Furnace Bonnets and Collars—Making Pipe and Elbows—Register Boxes and Stack Shoes, etc.

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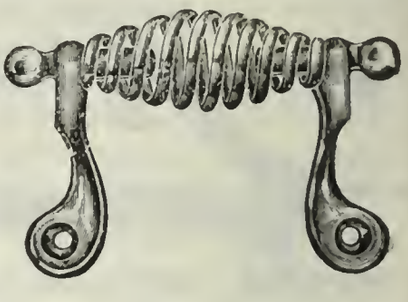




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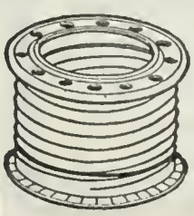
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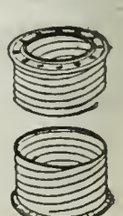
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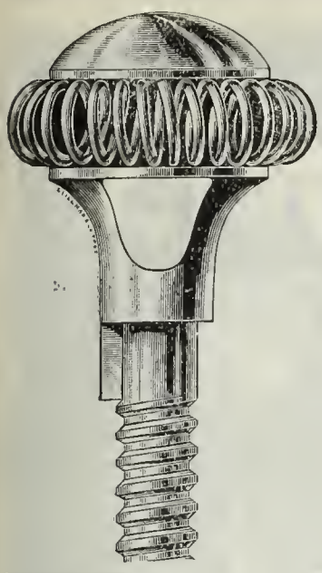
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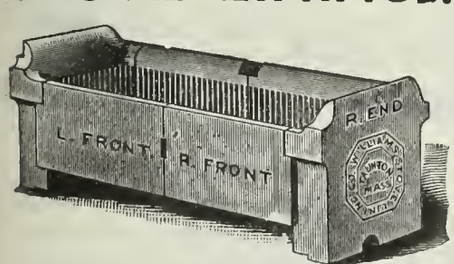
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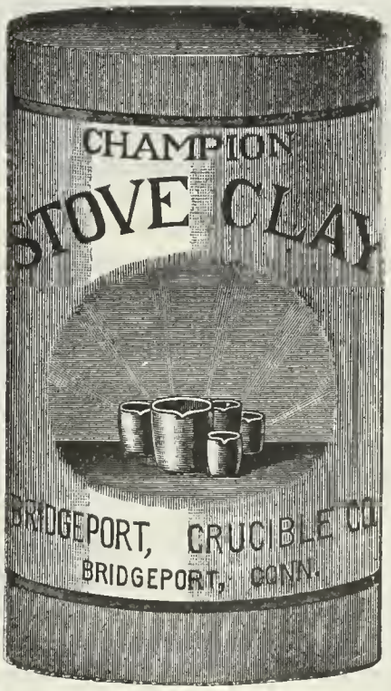
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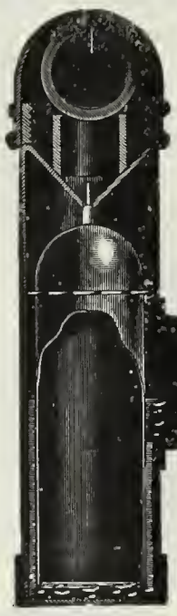
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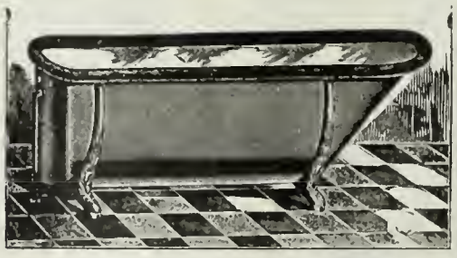
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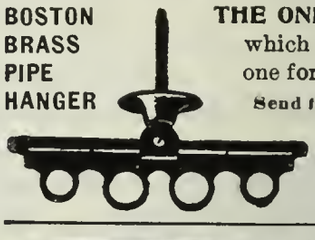
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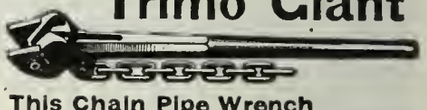


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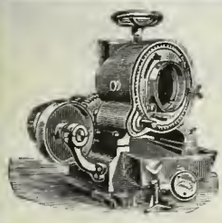
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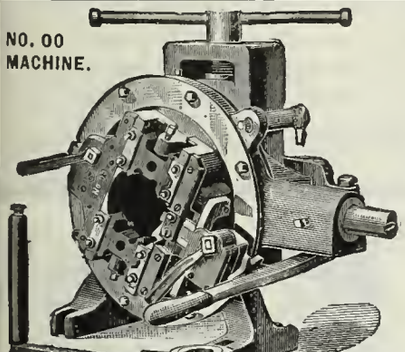
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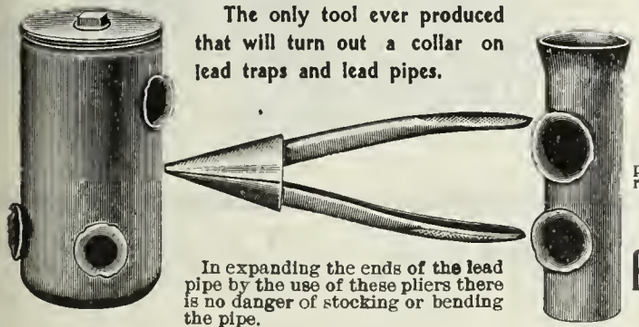
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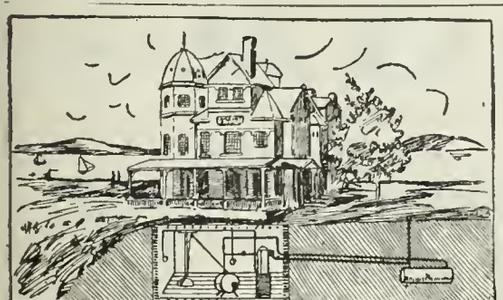
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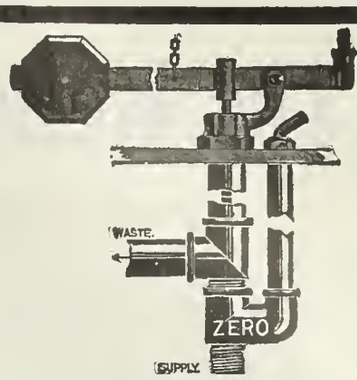
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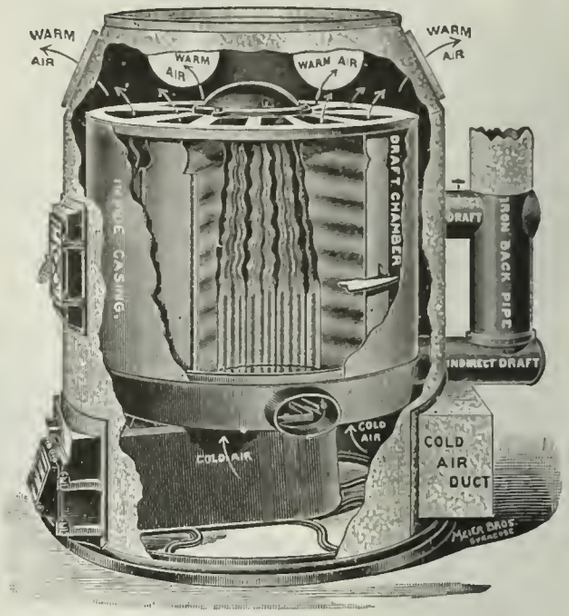
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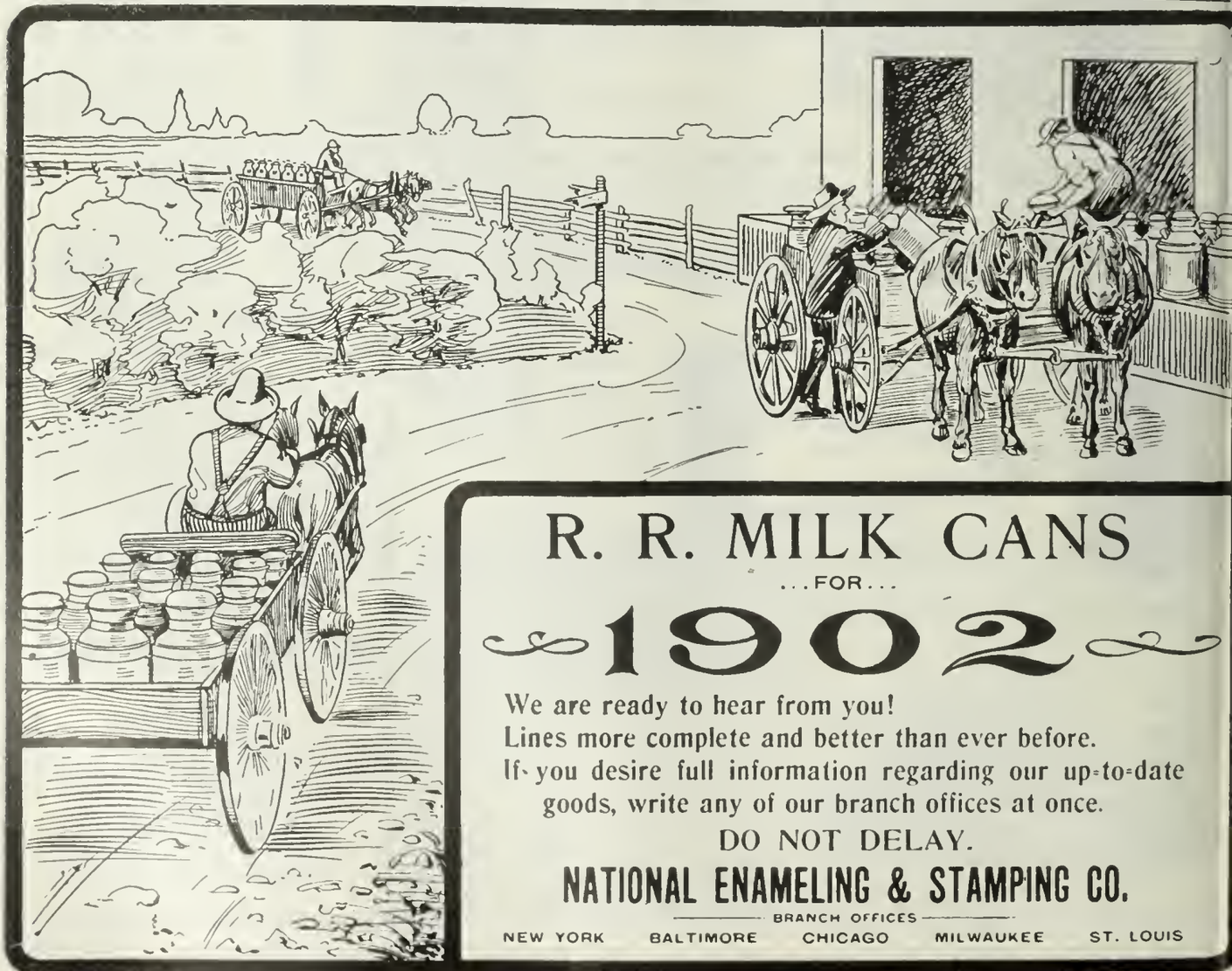
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Acetylene and Electricity.

Many of the recent disastrous fires have, on investigation, been traced to the use of electricity, and the public is not by any means satisfied that the methods of electric illumination and electric motive power have yet been developed to the point of perfection. Yet, great as have been the loss and damage resulting from this cause, there is no doubt that the popularity of electricity for lighting and other purposes will continue. The acetylene people, however, are taking these electrically caused fires as a text for arguments in support of the interests of their form of illumination. They urge that while the bright white light produced by acetylene gas is of itself a strong argument in its favor as a substitute for the yellow and dull red of the incandescent electric light, the element of safety is a far greater inducement. The advocates of acetylene point out that the losses sustained last year by fires directly traceable to electric wiring amounted to over $20,000,000. On the other hand it is claimed that not a single fire loss amounting to $1000 was reported as being caused by the use of acetylene gas, notwithstanding that there are in use over $200,000 worth of acetylene gas generators of more than one hundred different makes and of good, bad and indifferent construction. That there is still room for improvement in the installation of electric systems is acknowledged, and the same is true of the acetylene lighting apparatus and its construction. The plumber and general mechanic, however, is more interested in acetylene lighting, as the field for its use is not confined to cities but is found wherever a fine residence or small village exists. As an individual system for an isolated building requiring, say, one thousand lights, as in the various rooms of a summer hotel and its grounds, the acetylene system has proved acceptable, as well as for lighting the streets of small towns. It is equally well adapted for the small cottage of the suburban resident or the farm house. These features, together with the superior light afforded, have already made the light popular, and it only requires a greater familiarity with it on the part of the public to greatly increase its use. The installation of acetylene apparatus may be readily effected by mechanics engaged in the trades to which our columns are devoted and their attention is commended to a study of acetylene with a view of securing the benefit that may be derived from a more general use of this system of lighting. There are certain principles that have been discovered in connection with the generation and use of acetylene gas that must invariably be observed. These must be learned and impressed upon customers in order to avoid the accidents that were incidental to the early use of lighting plants of this class. Where these principles are thoroughly understood and the apparatus used accordingly, the comparative immunity from fire losses referred to above is likely to be maintained where acetylene gas is used.

Furnace Air Supply.

Laws to compel the change of air, in school buildings in particular, by taking fresh air from out of doors, warming it and then sending it into a building, with provision to exhaust the air previously contained therein, have had a noticeable influence in the East on the method of supplying furnaces with air. It is quite a common custom, and one that is growing, to provide the furnace with a duct connected at the bottom and leading to a point outside of the building, so that the exterior air can readily flow in, to pass over the heated surface of the furnace and be distributed through the building by means of the hot air pipes. The size and location of this air supply duct have remained an unsolved problem to many in the furnace trade, although experienced men favor running it from the most exposed side of the building and providing it with a capacity equal to from two-thirds to three-quarters of the area of the combined hot air outlets from the top of the furnace. Evidently this custom is by no means universally observed, at least in some sections, in the West. The conditions there are somewhat different from those obtaining in the Eastern part of the country. The Western winters are apt to be more severe throughout their entire length, and the period at which the mercury ranges below zero is much longer extended. Consequently the heating of buildings with furnaces is a somewhat more difficult problem in that section. Quite a strong favor is shown to the use of return air ducts in the West. In many instances provision is made to take some air from out of doors, but the damper in this section of the air supply duct is frequently closed as soon as severe weather is experienced and the supply of air for the furnace is taken from the inside of the building. Whatever may be urged against this practice from an advanced sanitary standpoint, the arguments are strongly in its favor from an economic point of view. There is no question but that the building in which the heating is so arranged can not only be more readily warmed and the temperature more evenly maintained, but also with a much smaller consumption of fuel than if the entire air supply was taken from out of doors with the mercury from zero to 20 or 40 degrees below. The fact that this method of using furnaces has been customary for many years also strengthens the position of those who advocate it. When the question of the purity of the atmosphere in such buildings is raised it is pointed out that the buildings are occupied by comparatively few people to vitiate the atmosphere, and that a sufficient change to maintain a satisfactory purity is effected through the natural leakage around the crevices of the windows and the building generally, in addition to the large amount of air that will naturally be admitted through the open-

ing and closing of the doors. In this connection we present elsewhere in this issue an article from a furnaceman who has had a long experience with the return air system of furnace heating, which should prove of special interest to the trade.

Progress of a Century.

Some very striking comparisons, illustrating the changes that have come about in the United States in the course of a century, are presented in the statistical abstract just issued by the Treasury Bureau of Statistics, and which is founded upon the census returns from the years 1800 to 1900. In the first place the remarkable growth of the country is shown in the fact that the gross area of the United States, exclusive of Alaska and Hawaii, grew from 827,844 square miles in 1800 to 3,025,000 square miles in 1900, while the population increased in the same period from 5,308,483 to 75,693,724. That is, the area of the country, exclusive of the territories mentioned, was more than three and one-half times as large and the population fifteen times as great at the end as at the beginning of the nineteenth century. One of the most remarkable contrasts is that of the foreign commerce of the country. In 1800 the imports were valued at $91.000,000 and the exports at $71,000,000, the imports exceeding the exports by $20,000,000. In 1900 the imports were valued at $823,000,000 and the exports at $1,487,000,000, the exports being $664,000,000 in excess of the imports. In other words, while the annual imports grew in value more than nine-fold in the century the exports of the last year of the century were twenty-one times as great as those of the first year. The comparisons as to the wealth of the country are also very impressive. Thus the total deposits in savings banks in 1820—the first time when such statistics were gathered—amounted to only $1,138,576, and the depositors numbered 8635. In the year 1900 the depositors had increased in number to 6,107,083, and the amount of money on deposit to $2,449,547,885. Thus the number of the depositors in savings banks was 700 times as great and the amount of deposits over 2150 times as great at the end of the century as at the beginning. Similar contrasts could be extended to great length, but those above quoted will serve to give some idea of the extraordinary measure of material progress secured by this country in the course of the past century.

Hardware Consolidations.

The subject of consolidation has of late been obtruding itself on the attention of the trade. Speculation is rife in regard to the movement among the jobbers to effect a unifying of their interests. While it is known that negotiations to this end are being continued, those connected with the project have not taken the public into their confidence, notwithstanding certain mysterious intimations that developments may be looked for before long, with possibly the announcement of the successful conclusion of the negotiations in some form. In the manufacturing field more evident progress is being made. The coming together of the axe manufacturers in an agreement which looks toward consolidation of their interests is familiar to the trade, who are thus confronted by a market of even and somewhat confident tone instead of the uncertain and disturbed condition with which they have had to do. This action of the axe manufacturers was in good measure anticipated by those in close touch with trade movements, but the announcement made in this issue of the uniting of the interests of two great companies manufacturing builders' hardware will be received with a sensation of genuine surprise, as the matter was consummated so quietly that very few were aware that negotiations were being conducted to this end. This consolidation will be generally recognized as an eminently wise move on the part of the great corporations whose interests are thus harmonized, and it should do something to induce a better condition of things in the disturbed line of trade to which their products belong. If it should be followed by efforts to eliminate or diminish the confusion which prevails in the selling of builders' hardware and the methods which make it unprofitable to all classes in the trade, it will be a matter for general congratulation.

The following, received this week from our London correspondent, gives added point to the editorial on the subject of insufficient postage printed in our last issue: "American export firms," he remarks, "who are in the habit of sending catalogues and other communications to this country would be well advised to give specific instructions to their office boys as to the proper amount of postage required. Twice a week there comes into this office a batch of catalogues from various American firms, and it is a very rare occasion when I do not have to pay excess postage. This morning I have paid out no less than 90 cents excess postage on these catalogues. If the same sort of thing is happening in private counting houses, I am quite sure that considerable irritation is created. It gives the impression of carelessness. It is one of the little idiosyncrasies of the Englishman that he loves correctness in small matters, and it is just as well to humor him."

PROGRESS WITH PLAN TO AVERT STRIKES IN THE BUILDING TRADES.

In a recent issue we referred at some length to the work which is being done by William H. Sayward, secretary of the National Association of Builders, looking to the establishment of a permanent Court of Settlement and Appeal in connection with the building trades. It is gratifying to be able to record the fact that Mr. Sayward is meeting with consistent encouragement in his efforts to permanently harmonize the interests of employers and workmen in these trades in New York City, although up to the present time his labors have been limited to the presentation of his plan to organizations of employers and to securing their approval. Nearly all the organizations in the metropolis have been addressed on the subject and approval has resulted in every instance.

As soon as the plan has been presented to the remaining employers' organizations, it is Mr. Sayward's intention to pursue the same course with relation to the workmen. He will present the plans to the unions as rapidly as possible, until the whole field is covered and both employers and workmen have become thoroughly familiar with the scheme, its proposed details and the method of operation. No attempt will be made to put the plan into actual operation until the entire field has been thoroughly canvassed and sufficient support has been pledged to secure the success of the undertaking.

A large number of union workmen have been interviewed in an unofficial capacity by Mr. Sayward, and all have expressed themselves to him as heartily in favor of the plan and willing to do all in their power to aid its establishment.

A bill has been introduced into the New Jersey Legislature amending the general incorporation laws of that State, so as to compel New Jersey corporations to furnish to the public more information in regard to their operations. It calls for the publication of practically the information embodied in the recent annual report of the United States Steel Corporation. The measure is said to be strongly backed and to have a good prospect of enactment.

BUYING STOVES EARLY IN THE WEST.

The Western stove manufacturers are finding not only a good seasonable demand for their products, but are further enjoying a large inflow of orders for stoves to be shipped next fall. While this is customary in some special lines of goods, it is not usual for general orders for fall shipments to be placed so early. The conditions now governing the iron trade are of such an extraordinary character that stove dealers believe they are fully warranted in placing orders now, as they may thereby avoid the payment of considerably higher prices. The demand for iron and steel is observed to be running beyond the capacity of the country, although the production at present is in excess of anything before known. While it is appreciated that the leading interests in the iron and steel trades are endeavoring to keep prices down, yet experience teaches that a wave of phenomenal consumption is likely to overcome all efforts to stay such a commercial movement and that unless a great change occurs in the temper of consumers it is exceedingly probable that a considerably higher level of prices may be obtained. Under the circumstances, therefore, it is only prudent for dealers to fortify themselves against such a contingency. It is believed that the only adverse influence now to be feared is a failure of some one of the important crops of the country. Barring this contingency, on which all merchants must take their chances, the year promises to be one of magnificent trade in every respect.

MAKING LONG FURNACE PIPES WORK.

BY I. E. D.

In reading over the last issues of *The Metal Worker* I notice that some of the readers are having trouble with warm air furnaces and long pipes. I have been very successful with warm air heating, but my experience out here in Iowa is only with one and two-story buildings. It is immaterial to me where the furnace is located under the building. All I care for is to have the shortest and straightest possible run for the smoke pipe, which I always see is plenty large enough. I am also particular that the chimney works perfectly before I connect with it. Then I dig a pit under the furnace about 2 feet deep, never less than 2 feet. I then locate the cold air pipes, for which I dig a trench of the same depth as that of the furnace pit. If I have a long run of pipe, such as one of your readers has, I always take a cold air pipe from the same room that the long warm air pipe goes to. Then, in order to make the cold air pipe feed the return warm air pipe, I lay up a partition across the furnace pit and brick it up to the bottom of the furnace so as to have a complete circulation on that side or part of the furnace. The pit must be divided into as many parts as there are cold air pipes and in proportion to the cold air pipes. Where the long run of warm air pipe is connected to the furnace I have the cold air inlet directly underneath the warm air outlet. The cold air return is brought down from the room on the far side as far away from the furnace as possible and is conducted to the pit along under the floor of the basement, so that the basement floor may be cemented over and not interfere with the cold air pipes. I never place dampers in the warm air pipes in the basement, as I am always able to control the heat by closing the registers. I find in heating dwellings that it is not advisable to use cold air from the outside, because, with the opening of doors and the window, I have all the supply air that is needed without any outside dust and cold air.

I have just taken out a hard coal furnace which the owner has condemned as no good. When I first called on him I told him that his furnace was not properly set. He informed me that he had had that furnace "monkeyed with" for four or five years and by as good furnacemen as I was, and that he would not spend another dollar on it. So I sold him a new one, set it according to my ideas, guaranteed the job, and have never been called on to go back since the furnace was set. He is quite satisfied and has paid for his furnace, and all because I gave the furnace all the good cold air it could use. I took the old furnace and sold it to a merchant here who has a larger house than the first owner and he has always used a furnace. When he paid his bill he said that was the best furnace he ever saw and the only one in which all the warm air pipes worked alike.

Too many of the "boys" in setting furnaces have the idea that all the pipes of a furnace should have the same pitch from the furnace. This is wrong, as the pitch or rise in a warm air pipe must be determined by the distance the heat has to travel and the amount of heat that the pipe is required to carry, and every pipe should be put up on this theory.

I never use less than 8-inch round pipes and those only to bedrooms and for short runs. I always try to take the cold air from bedrooms or halls into which bedroom doors can be opened, for we spend nearly half of our time in bed, where we need a more perfect circulation than when we are stirring around. I am never bothered with dust in the rooms through the warm air pipes, as I have the cold air pit deep under the furnace and a thin coat of cement all over the bottom and out in the bottom of the cold air inlet. In order to find how much cold air a furnace should have I first find how many warm air registers there are and their capacity, and then make my cold air inlets of the same capacity. I am then sure that the furnace has all the cold air it needs. Never make the cold air pipe smaller than the warm air pipe, for the warm air travels faster than the cold air; therefore it equalizes the flow, although the heated air has expanded.

Acme Gas Appliances.

H. Adler Company, Pittsburgh, Pa., are sending to the trade a very neatly printed and illustrated catalogue and price-list of 16 pages, printed in two colors, relating to the Acme gas ranges, which they manufacture in several varieties. The Acme ranges are shown with handsome exterior, cast ornamentation being largely used in the external decoration. The constructive features are of the latest type, and the fuel may be artificial or natural gas. The sides of the cast ranges are made perfectly plain, but are heavily ribbed at the weak points. The ranges are full asbestos lined, tightly cemented, so that no air whatever can come between the asbestos lining and the iron, therefore avoiding condensation between them, which would rust the oven in a very short time. This feature of construction, the manufacturers claim, can only be successfully used where the parts are perfectly flat, and that is the reason why they do not use an ornamental side. The plain cast side can be made lighter than the ornamented, and the less iron there is in the body of the range the less heat it will absorb and the better the test with the oven for the amount of gas consumed. Extra heavy needle valves are used on all ranges, excepting for artificial gas, where the lever cock is used. The closed top ranges are provided with a flue system, by which each burner has a separate flue for supplying it with fresh air, and also an exit flue for carrying off the burnt gases. The manufacturers state that all the burners in the Acme ranges are constructed and adjusted in such a manner that they will operate perfectly, on the lowest or highest pressure, without the gas catching at the valve orifice on the lowest pressure or burning yellow on the highest pressure, and without changing the valve orifice in any of the valves after the mixer collars have been properly set for the gas on which the range is to be used. The Acme range is made with combination broiler and water heater attachment, as well as plain. The pamphlet also gives attention to what are known as the Acme and Perfect cookers, the Perfect Cooker Junior, the Acme baker, the Improved Acme and Perfect ovens and the Acme hot plates. A telegraphic code is a feature which will be found of interest and value by dealers desiring to order goods by wire.

A FIRE which occurred on the evening of February 17 practically destroyed the plant of the Dauntless Stove & Burner Company at Massillon, Ohio. It is stated that the loss is largely covered by insurance.

SOME SHORTCOMINGS OF FURNACEMEN.

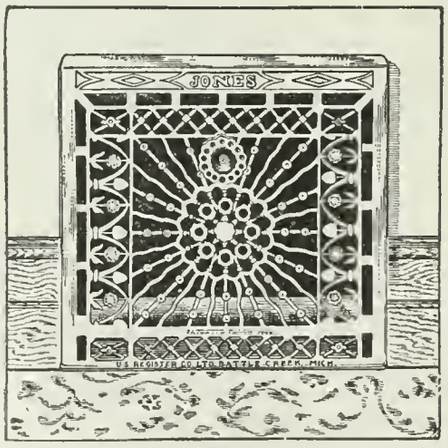
BY G. M.

It has given me pleasure to read some of the articles on furnace setting in *The Metal Worker*, as it indicates that the trade is waking up on some good practical points. Having had 20 years' practical experience in setting furnaces and superintending some high class work I feel at liberty to point out some of the shortcomings of the furnacemen. In some instances they have recommended a class of work merely for the sake of receiving a contract at the hand of the architect or builder, which action, in the end, has been detrimental to the whole trade. Since the manufacturer of furnaces has advanced the portable furnace to take the place of the brick set furnace, furnacemen have followed in the wake and left trailing behind them some work that is not very creditable. From my experience, there is nothing in the portable furnace that will recommend it as a heater. By the force of the same circumstances we have accepted the conditions as they have been found by using rectangular and oval pipes to convey hot air up through partitions, which of itself will not recommend the sale of the furnace for heating buildings.

There is yet another feature of which I wish to speak. The most important thing of all in hot air heating is the cold air supply, and it should be treated as such. I have seen the air box taken from all sides of the building at or below grade; sometimes from the garbage yard, or near the cesspool; which is all wrong. This is a matter which, in my experience, I consider has not had proper care with a view to the health of the occupants of the house and to good results from the furnace. I should like to see, through the agency of *The Metal Worker*, some discussion and arguments as to the first principles, and then we can advance to the practical features.

The Jones Side Wall Register.

A register that is said to materially increase the efficient capacity of hot air flues is presented in the Jones side wall register, patented by A. O. Jones, and made by the United States Register Company, a new corporation recently organized at Battle Creek, Mich., with a capital of $100,000. The officers of the company are L. Moblo, president; G. Redner, vice-president, and A. O. Jones, secretary and treasurer. Boyd Redner and William S. Jennings, with the officers, form the Board of Managers.



The Jones Side Wall Register.—Fig. 1.—General View.

In the accompanying illustrations Fig. 1 gives a general view of the register, from which it can be seen that the face is of a very open pattern, presenting little obstruction to the outflow of the warm air. Where but one room is to be heated, the register sets flush with the base board; where two rooms are to be heated, it projects into the room 1½ inches at the bottom. The register is designed to set in a cast iron collar, and a space between the register proper and the collar allows air to flow in through the outer openings in the face plate, while the space around the hot air flue is made available for ventilating purposes. This is clearly indicated in the sectional illustration, Fig. 2, which also shows a valve for opening and closing the register whereby no obstruction is presented to the passing air, while the supply can be regulated in quantity as desired, and the course of the flow be thrown naturally in the direction desired. The register box included with each register enables it to be set flush with the wall or swung forward at the bottom by means of lugs. The provision of this register box leaves the register ready to be installed and saves the time and material used in making register boxes. The registers are made in a variety of sizes and finishes. In operation they are said to aid the flow of air from the furnace, by avoiding friction and thereby substantially increasing the heating capacity. This register is the subject of a four-page circular, which presents it in a most attractive manner.

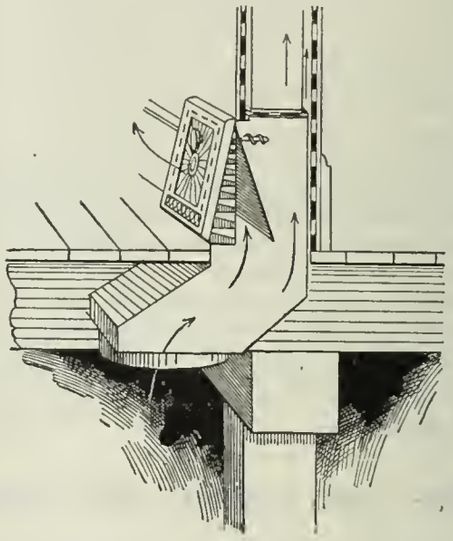


Fig 2.—Sectional View, Showing Valve and Ventilating Feature.

Robinson Furnaces.

The new 64-page catalogue of the Robinson Furnace Company, 107 and 109 Lake street, Chicago, gives full details regarding the line of furnaces which this company now have on the market. These furnaces embody some special features which are original and are fully protected by patent. Prominent among these features are the construction of the Tubular furnace and the hot blast for soft coal. Additions have been made to the original points from time to time, as conditions seemed to demand, and the line is claimed to be up to date in every respect.

The leading place in the catalogue is given to the Robinson Tubular furnace, which is constructed with vertical tubes surrounding the combustion chamber. The air to be heated passes through these tubes, which are directly exposed to the fire, and it thus becomes thoroughly heated by positive action. The Tubular furnace is built with a radiator having cast iron tops and bottoms, and the vertical flues incased in a heavy sheet of refined steel in one piece, or with a radiator wholly made of cast iron with no joints in the top. It is so constructed that it has a full revertible flue to secure the perfect extraction of the heat units from the products of combustion.

The Robinson Hot Blast furnace for soft coal is constructed with a gas ring passing around the upper part of the fire pot. This gas ring has eight sectional linings, which form its inner part and can be replaced through the feed door without dismounting the furnace. The gas ring has numerous holes through which the heated air can be discharged into the fire pot to secure perfect combustion of soft coal to which it is specially adapted. This furnace is also constructed with a radiator having vertical tubes through which the air passes to be heated.

The Reliable line is constructed with steel radiator and sectional fire pot, and is adapted to either hard or soft coal. The dome is extra heavy and large at the bottom and drawn in at the top. The air passes close to the fire pot, then over the bottom of the dome between it

and the radiator, thus getting full benefit of all the heated parts of the furnace. The radiator is made of heavy steel, and so constructed that the products of combustion make a complete circuit before entering the smoke exit.

The Robinson Tubular wood furnace is built for the use of wood exclusively. It has a horizontal fire box made of cast iron, heavily corrugated, with a feed door extra large to admit almost any kind of wood. The radiator is built of heavy steel, with cast iron top and bottom, and is furnished with a number of vertical flues for the passage of the air to be heated.

The Robinson Tubular hot water and warm air heater is a combination furnace, consisting of the tubular furnace fitted with an Eclipse water heater. This is a powerful heater, which will carry from 50 to 700 square feet of direct water radiation according to the size.

The Eclipse combination grate is a construction specially designed for the use of either gas or coal, and is supplied with all Tubular furnaces, if desired. With a grate of this kind gas can be used for ordinary winter weather, and if the supply of gas is weak coal can be used to add to the heat in extreme weather.

An illustration is given of a cast iron smoke box with a damper which is used on all Robinson Tubular furnaces. This smoke box is placed between the furnace and the smoke pipe. When the damper is drawn back the smoke enters the pipe directly, but when it is closed the smoke divides at the rear and makes two complete circuits of the radiator around the flues before entering the exit. This smoke box is also furnished with a check draft, to be connected by chains to the chain plate in an upper room.

The catalogue further contains illustrations of furnace fittings, instructions for setting furnaces and numerous testimonials from those who are using the Robinson line.

WHAT SHOULD A FURNACEMAN KNOW?

BY O. N. E.

We look upon this subject as entirely too large to give even a synopsis of it in one article, so we will be content at this time to confine ourselves to the cold air duct, and possibly we may at some future time work backward from that to the furnace.

Now we often hear that the air box should be of ample size, but to many of us that word ample has a varied meaning. So let us see if by the use of a little reasoning we may not be able to arrive at the proper meaning of the word in this connection. As a basis for this calculation let us suppose the outside temperature to be zero and the air escaping at the register to be 140 degrees above zero. Now we find that 1 pound of air at zero occupies a space of about 11½ cubic feet, and at 140 degrees above about 15 cubic feet, or an expansion of about one-third. So that at zero we would say that a cold air duct of two-thirds the area of all the warm air pipes would be the proper size.

But then we must remember that we do not at all times have zero weather; so to provide for warmer weather we would advise that the cold air duct should never be made less than three-fourths the combined area of all the warm air pipes. Again, we must remember that the duct must be built smooth, as we have made no allowance for loss through friction, and there must be no contractions that will reduce the size of the duct at any point below the dimensions figured on.

Now let us see that the inlet to this duct is in some good position—not near some dirty slop sink, or other damp, foul smelling place. We must also have the duct made perfectly tight if we would have good, pure air, free from dust. We would place a nice, smooth working damper in the duct, so that it may be partly closed off in case of strong winds blowing into the mouth or in case some of the registers are closed. In this instance, of course, we should not need such a large volume of air.

Now that we have provided for an ample cold air supply we must, if we wish a good job, provide some means for the exit of the cold air from the rooms above. This can be easily and cheaply done by the use of ventilating faces placed in the base boards of each room in which we have a warm air register. We have found a face 6 x 15 inches a very good size for this purpose, and it can be placed so as to take up the space between the studding. We have a ventilating flue already made for us to the garret, only we must be careful not to place the faces in the same line of studding. This will provide an easy outlet for the cold and vitiated air to the attic, when, as a rule, it will easily find its way from there to the outer atmosphere.

Common Sense Heat Circulator and Radiator.

A new drum or radiator, which is herewith illustrated, is being manufactured by the inventor, A. C. Selleck, 755 and 757 West Madison street, Chicago. It is named the Common Sense heat circulator and radiator, and is offered to the trade as a device representing the thorough utilization of natural laws in securing the additional heat to be obtained from the application of the principle of the well-known drum. Fig. 1 is an exterior view of the radiator, and Fig. 2 exhibits it with a portion of the casing removed to show the interior construction. This drum is of such length that it is only necessary to

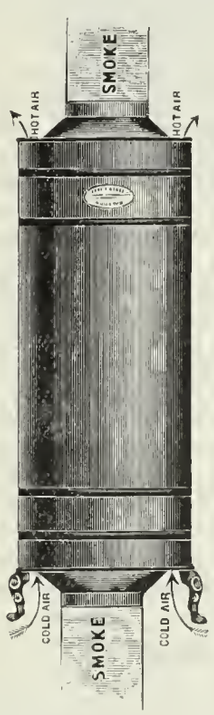


Fig. 1.—Exterior View.

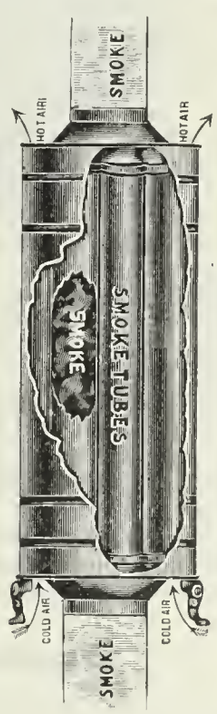


Fig. 2.—Broken View.

Common Sense Heat Circulator and Radiator.

remove one joint of pipe. It is constructed so that the smoke is divided and passes through a number of vertical tubes, thus securing a very large radiating surface against which the air comes in contact, being admitted at the bottom of the drum and expelled at the top. The difference between this actual construction and that described by an error in our last issue will be readily seen. The arrangement provides a number of passages between the tubes and the casing, through which the air to be heated is drawn. It is claimed that this construction secures a constant circulation of heated air in the room, which equalizes the temperature. This heater, being open at both ends and having vertical passages for the air, undoubtedly secures vastly better results than a construction having horizontal passages. It is as easily cleaned as a joint of pipe and does not affect the draft. It is made of Wood's refined and American Russia sheet iron and is very neat in appearance. While this is a superior article in every respect, it is sold at a very moderate price.

The Art Stove Company, Detroit, Mich., have in process of construction a large power house, in which when completed they will install new engines, boilers, blowers, &c. The addition has been rendered necessary by their largely increased business.

The Pittsburgh Stove & Range Company.

The Pittsburgh Stove & Range Company of Pittsburgh, with main offices in Allegheny, Pa., purchased some time ago 23 acres of land in Beaver, Pa., near the Pittsburgh & Lake Erie Railroad and will extend the manufacturing operations at that place. The concern have been negotiating for some time with the Board of Trade of Beaver Falls, Pa., with a view of locating in that district. Satisfactory arrangements have been made between the two parties, and the Board of Trade have given bond to the amount of $100,000 for the faithful performance of their contract. Among the terms of the latter is the agreement that the Board of Trade shall sell, at $300 each, 250 building lots embraced in the land acquired by the company.

Plans for the new plant are being prepared by a Pittsburgh engineer, but have not yet been completed. The number of buildings and their size are still to be decided upon. But on the whole the plant will cost in the neighborhood of $300,000. Work on the construction of the buildings is to be started as early in the spring as possible. The new industry will employ from 800 to 1000 men. The output of the centralized plants will be the same as that of the plants abandoned—gas ranges, furnaces, cooking stoves, gas and coal stoves and ornamental grates for coal and gas.

The nine stove manufacturing plants to be abandoned by the Pittsburgh Stove & Range Company are the original ones absorbed when the combine was organized. These include five in Allegheny—the plant of Anshutz, Bradberry & Co., on Preble avenue; that of De Haven & Co., Preble avenue; that of Crea, Graham & Co., Rebecca street; that of Bissell & Co., Darrah and Robinson streets, and that of F. & L. Zoegtly, Preble avenue. The other plants to be abandoned are those of Graff & Co., Monongahela; Walters, Walker & Co., Sharpsburg; Baldwin & Graham, New Castle, and A. Bradley & Co., Wood street, Pittsburgh.

Each of these nine plants is to be dismantled. The work now done by them is to be transferred to the big plant at Beaver Falls. Some of the machinery in the plants to be abandoned will be taken to the new works, but most of it will be sold. The properties will be placed upon the open market for sale. In short, these nine industries will soon cease to have any existence. The combined works now employ possibly 800 men.

Enameled Steel Ranges.

The St. Louis Enameling Company of St. Louis, Mo., are a reorganization of the Artistic Enameling Works, the pioneers in the manufacture of enameled steel ranges well known under the name Artistic. New and ample capital has been secured, and the plant, at the old location at the corner of Ninth and Monroe streets, St. Louis, has been overhauled and several new and improved machines have been added to the equipment, enabling the company to largely increase their productive capacity. In addition to ranges they make a complete line of enameled signs and do general enameling work on steel specialties. A revised price-list and catalogue is on the press, and in about 60 days a large and complete general catalogue of their entire line is to be ready for distribution. It is stated that all demands for immediate shipment can now be complied with. The company will be glad to send their catalogue to all interested parties.

The Peninsular Stove Company, Detroit, Mich., are making preparations to increase their facilities by the erection of a six-story addition on Fort street, west, between Eighth and Tenth streets. The plans, which have been drawn by Architects John Scott & Co., call for a structure with a frontage of 200 feet on Fort street and a depth of 50 feet. There will be a basement under the entire building, and a brick subway will connect it with the present foundry on River street. While the structure will be largely used for the storage of finished goods, it will also contain several offices. The contracts for the steel and iron work, the carpentry and the mason work have already been awarded.

ODD PLATES.

Frank G. Gardner, who for many years has been connected with the Chicago house of the Michigan Stove Company, in their advertising department, has been transferred to the home office, and has therefore removed his residence to Detroit.

The Dauntless Mfg. Company recently held their annual stockholders' meeting at Beaver Dam, Wis., and voted to change the name of their corporation to the Malleable Iron Range Company. They also decided to increase their capital stock from $65,000 to $100,000. The officers elected for the current year are as follows: President, J. W. Miller; vice-president and general manager, Silas McClure; secretary, Peter Beule; treasurer, John C. Zander; superintendent, A. C. Terrell.

Prior to his departure last week for China, to take up a lucrative business position in that country, W. P. Millar, who for the past three years has had the management of the Stove and Furnace department of the James Smart Mfg. Company, Limited, of Brockville, Ont., was the recipient of a gratifying testimonial of the esteem of his fellow employees, in the shape of a handsome cabinet of silver ware, together with a complimentary address containing expressions of their regret at his departure and good wishes for success in his new sphere of labor.

The new addition now being made to the Abram Cox Stove Company's plant at Lansdale, Pa., was damaged by a recent storm to the extent of $600. The 32-ton cupola has been put in place, and the new building is progressing rapidly.

The Michigan Stove Company have improved their line of Fireside-Garlands by the addition of an entire cast iron plate in the front; the improvement of the back linings for the purpose of protecting the entire sheet iron body, and the addition of a smoke guard to prevent the smoke from coming out when the feed door is open. These improvements have necessitated a change in the prices upon this line of Stoves. The company have therefore issued a new list of prices to take the place of the former list. They state that this improvement makes the Fireside-Garland one of the most serviceable Stoves of this class on the market. Last year they were unable to supply the demand for this line, but they are now prepared to manufacture them in large quantities.

George M. Clark & Co., Chicago, are favoring the trade with a match book, consisting of a number of paper matches conveniently arranged in a cover bearing the company's trade-mark, a picture of a Jewel Gas Range and other references to their well-known line. Each match also has its own reference to the Stoves.

A. W. Glessner, president of the Excelsior Steel Furnace Company, Chicago, Ill., was elected president of the Inland Press Association at the meeting of that body in Chicago last week. He is also a member of the Associated Press. Mr. Glessner called at *The Metal Worker* office this week while in New York attending the banquet given to Prince Henry of Prussia.

The Ohio Stove Pipe & Mfg. Company, New Philadelphia, Ohio, are sending out a pamphlet illustrating and describing their Nested Stove Pipe, which in putting together requires no tools or hammering down of the seams. In addition the company manufacture Four-Piece Elbows and Adjustable Thimbles.

An instructive suggestion of the progress of a half century in the science of Stove construction was given recently by Murray & Dugdale of Haverhill, Mass. They exhibited in their windows a Stove cast at South Newmarket, N. H., in 1852, and with it a Sunshine Oak cast in 1902. The former is small and antiquated, but the proprietors assure us that it is just as ready to work, if necessary, as in 1852.

The Gurney-Tilden Stove Mfg. Company, Hamilton, Ont., have recently established an agency for their goods in Vancouver, B. C., which will be under the charge of a man thoroughly familiar with local conditions. John H. Tilden, the head of the concern, recently made a trip to Vancouver for the purpose of completing the necessary arrangements.

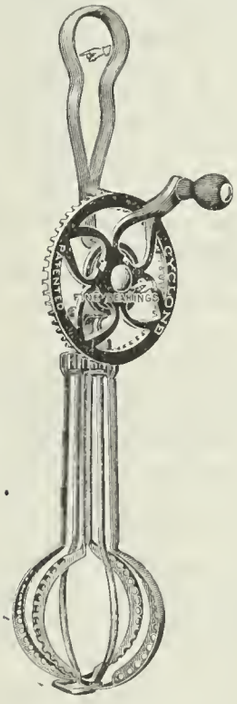
At a recent meeting of the stockholders of the South Pittsburg Stove Works, held in South Pittsburg, Tenn., it was decided to sell the plant, machinery and stock on February 20. The plant was located in South Pittsburg about 14 years ago, and is said to have cost to erect and equip between $250,000 and $300,000, and to have a capacity of something like 40,000 Stoves per annum. The works are in good running order and can be started on short notice.

At a recent meeting of the stockholders of the Parrot Stove Company, Carthage, Mo., it was decided to sell one-half of the stock to C. E. Weeks of the Weeks Hardware Company of Carterville, and to lease the other half to him, on the payment of certain royalties, for two years. It appears that the question has been under consideration for some time, and now that it has been decided in his favor by a majority representing over two-thirds of the stock Mr. Weeks will, as soon as possible, take charge of the plant and put the goods on the market. The castings and steel used in the construction of the Stoves will, it is said, be purchased of a foundry in Gerard, Kan. It is intimated that Mr. Weeks may possibly resign his position as manager of the hardware company and move to Carthage, in order to be better able to look after his interests in that place.

The Odin Stove Mfg. Company of Erie, Pa., have just issued from the press their price-list for 1902, relating to Gas Ranges, Hot Plates, Water and Tailors' Iron Gas Heaters, together with other gas appliances which they manufacture. It is an interesting publication of 24 pages, profusely illustrated with leading lines, including the Eric Gas Range, offered in several sizes; the Eric, Odin and Viking Hot Plates, ranging from one to four burners; the Eric Gas Ovens and Tri-Odin Three and Four Way Burners.

The Cyclone Egg Beater.

William G. Browne, Kingston, N. Y., is offering the trade the egg beater shown herewith. The perforations in the wings are referred to as the most prominent feature of the beater, as it is explained that by them the egg is caught, held and thrown from one flange to the other, and in passing through the perforations is quickly and thoroughly beaten. Among other points of excellence the following are mentioned: That the handle fits the hand; that the bearings are long and the holes are all drilled; that both the blades an dthe shanks are flanged, making them rigid; that the crank handle is of good size and that the foot at the bottom helps to steady the beater when in use. The manufacturer states that it is an excellent cream whip, and is strong enough to beat cake.



The Cyclone Egg Beater.

Rippley's Whitewash and Painting Machine.

The Rippley Hardware Company, Grafton, Ill., are offering the trade the whitewash and painting machine shown in the accompanying illustration. It has an agitator to keep the solution mixed that works at each stroke of the pump. The top of the can is removable, so that it can be easily cleaned. The body is made of No. 24 galvanized steel, and is fitted with a ball valve brass cylinder pump, which, it is explained, will produce a high pressure. It is pointed out that it is not a compressed air machine. When not in use as a whitewashing machine it can be used, it is stated, for spraying trees, gardens, washing windows, buggies, &c.



Rippley's Whitewash and Painting Machine.

Pennsylvania Retail Hardware Dealers' Association.

J. F. Frye, Charleroi, Pa., secretary of the Pennsylvania Retail Hardware Dealers' Association, announces that a meeting of this association will be held March 26 at the Monongahela House, Pittsburgh. It was originally intended to hold this meeting early in February, but the date was put back so as to give the Committee on Programme more time to arrange its work. This is a recently formed association, and the initial stages of the work have been rather difficult, as the members are more or less strangers. There is now good ground for the hope that the programme will be a very useful and entertaining one, with representative merchants taking conspicuous parts.

Enterprise in Marketing Novelties.

Various expedients are resorted to by enterprising manufacturers, who, having evolved a good article in which they have confidence, seek to get it before the buyers or general public in the most effective and expeditious way, even at the cost of considerable effort and expense. Such an undertaking was begun a few months ago by a Pennsylvania manufacturing company, whose specialty is household and kitchen novelties and labor saving utensils, many of which have been shown in these columns. After discarding several plans as ineffective, they decided to send, with their compliments and express charges prepaid, one of their latest novelties, a cherry stoner, to the buyers in concerns handling such classes of goods at their home addresses, together with a sealed can of cherries with which to make at once a practical test in the presence of the housekeeper or cook, although the article works even better with fresh fruit. A large number of these were sent out in the United States, but the intention is to exploit it in the same way abroad where such fruit is raised.

INDIANA RETAIL HARDWARE DEALERS' ASSOCIATION.

The meeting of the Indiana Retail Hardware Dealers' Association, held last week in Indianapolis, was in all respects a most successful convention and thoroughly representative of the retail hardware interests. There was a large attendance of the membership, to which many accessions were made during the meeting. The programme was an admirable one, carefully prepared and carried out with unflagging interest to the close. The counsels of the association were directed largely to the correction of trade abuses, and many valuable suggestions were received by the members.

At the opening session, on Wednesday morning, February 19, Mayor Bookwalter of Indianapolis welcomed the delegates in a graceful address, which was ably responded to by President W. P. Lewis.

The president appointed the following committees:

COMMITTEE ON PRESS: E. C. Minus, Hammond; Mr. Price, Marion; H. J. Trueblood, Washington.

COMMITTEE ON RESOLUTIONS: E. E. Schenk, Mt. Vernon; W. L. Hubbard, Scottsburg; F. M. Smith, Ft. Wayne; W. A. Shipley, Lafayette.

COMMITTEE ON NOMINATIONS: Chas. F. Boonshot, Petersburg; A. W. Smith, New Pass; T. M. Layne, Cloverdale; Chas. B. Frame, North Manchester.

AUDITING COMMITTEE: N. R. Stoner, Rochester; M. Meyer, Jr., Covington; M. P. McDaniels, Winchester.

A. H. Burkett of Goshen was appointed sergeant-at-arms.

At the afternoon session, President Lewis delivered his annual address, and at the close of the address I. A. Sibley, chairman of the Executive Committee, presented him on the part of the members with a handsome gavel, accompanying the presentation with words of hearty appreciation of the valuable services rendered by Mr. Lewis to the association.

Several interesting and able papers were presented and discussed, among which was one on "Window Display and the Art of Selling," by H. W. Beagle of the Robeson Cutlery Company, Rochester, N. Y., and one on "Hardware Store Arrangement," by J. D. Warren of Chicago. H. P. Townley of Terre Haute discussed "Up to Date Hardware Advertising."

On Thursday morning the proceedings were of an executive character, and during them attention was given to many matters of a somewhat confidential nature, relating to the work of the association. Subsequently the report of Secretary M. L. Corey of Argos was presented.

One of the subjects which demanded special attention was the competition of catalogue houses. Other forms of competition to which the hardware trade are subjected were also considered by William R. Powell of Converse, who spoke on "Illegitimate Competition." The treasurer's report showed the treasury of the association to be in a flourishing condition.

The Question Box was then opened, and a number of trade questions discussed at greater or less length. Among these were the following:

Should Stove dealers furnish repairs for Stoves purchased from catalogue houses?

Cries of No, No.

Why should not manufacturers confine themselves to 6 or 7 inch Stove Pipe Collars?

Mr. Sibley offered a motion to the effect that all the manufacturers of stoves are requested to make their stove collars to fit either 6 or 7 inch standard pipe. The motion was seconded, and unanimously carried.

What percentage does it cost you to do business?

One member stated that it cost him 10¼ per cent., another estimated that it cost him 10 to 15 per cent., another 11 per cent., including salary to the proprietor. A member said that figuring salaries and all expenses, including interest on the investment, he calculated it cost 16 1-10 per cent., and the losses from bad debts were one-quarter of 1 per cent.

Mr. Layne, for the Nominating Committee, reported that they had decided to recommend the re-election of the officers who had served so efficiently during the past year, and on motion they were unanimously chosen, as follows:

PRESIDENT, W. P. Lewis, New Albany.
VICE-PRESIDENT, James L. Fulton, Portland.
SECRETARY-TREASURER, M. L. Corey, Argos.

President Lewis, in a graceful speech, expressed his appreciation of the compliment paid him in re-electing him to office.

The Nominating Committee reported the selection of James Fulton and Howard Burkett as delegates to the national convention at Chicago, and Messrs. Jones of Richmond and Bush of Evansville were selected as alternates.

On the call of President Lewis R. R. Williams, hardware editor of *The Iron Age*, then addressed the convention in regard to trade conditions and association work.

Among the features of the convention was a smoker arranged by the merchants and manufacturers of Indianapolis, which was held on Wednesday afternoon, and which proved a most enjoyable occasion.

MISSOURI RETAIL STOVE AND HARDWARE DEALERS' ASSOCIATION.

The fourth annual meeting of the Missouri Retail Stove and Hardware Dealers' Association was held at the rooms of the Mercantile Club, St. Louis, on Tuesday and Wednesday, February 18 and 19. The convention was opened with an address of welcome by President B. F. Naylor of Marshall, who then proceeded to deliver his annual address, in which he briefly and gracefully gave the conditions as they exist in the organization.

Following the president Secretary Frederick Neudorff of St. Joseph presented his annual report. Mr. Best of Palmyra made a motion to appoint a committee to amend by-laws, and it was carried. The chair named as the committee Messrs. Best, Poland and Kansteiner.

At the afternoon session, on Tuesday, a paper on the "Evolution of the Hardware Business, 1850 to 1901," by William Kansteiner of Hannibal, was read by F. A. Kansteiner of St. Louis. Co-operative insurance and other interesting topics were discussed, and an address was given by R. W. Shapleigh of St. Louis, ex-president of the National Hardware Association.

At the Wednesday morning session a number of amendments to the constitution and by-laws of the association were reported by J. W. Poland of Carrollton, chairman of the Committee on Revision, and were adopted by the convention.

The election of officers and committees for the ensuing year resulted in the choice of the following persons:

PRESIDENT, Taylor Frier, Louisiana.
VICE-PRESIDENT, Edw. L. Wachter, St. Louis.
SECRETARY, Fred'k Neudorff, St. Joseph.
EXECUTIVE COMMITTEE: J. W. Poland, Carrollton; F. A. Kansteiner, St. Louis; Frank H. Mayer, Macon.
COMMITTEE ON TRADE ABUSE: B. F. Naylor, Marshall; M. A. Welgart, Kansas City; R. H. Myers, St. Louis.
AUDITING COMMITTEE: M. C. Post, Brookfield; W. T. Shoop, Richmond; Louis Boehl, St. Louis.

In accepting the office of president Mr. Frier expressed appreciation of the honor conferred and pledged hearty and loyal work in the interest and affairs of the association. It was decided to hold the next annual meeting also at St. Louis.

The St. Louis committee having in charge the arrangements for the entertainment of the visiting delegates comprised the following gentlemen: Louis Boehl, A. H. Gruendler, A. F. Geschwinder, F. A. Kansteiner, R. H. Myers, G. A. Pauley, Frank Salomo, August Steinmeyer, E. L. Wachter, Theo. C. Wirtz, who discharged their duties in a most efficient manner. On Tuesday evening a banquet was tendered to the association, which was much enjoyed.

The Buck's Stove & Range Company, St. Louis, through their representative, F. A. Spielman, on Wednesday evening tendered a theater party to some of the members. Those who enjoyed the hospitality of the company were Taylor Frier, John Best, J. M. Kenyon, B. F. Naylor, J. W. Poland, M. C. Post and W. T. Shoop.

The Charter Oak Stove Company, St. Louis, distributed a neat and useful souvenir paper cutter.

Among the representatives of manufacturers, jobbers and others present at the convention were the following:

E. C. Kempfer, Wheeling Corrugating Company, St. Louis.
George R. Barclay, E. H. Simmons, J. S. Payne, Simmons Hardware Company, St. Louis.
H. G. Koenig, Peninsular Stove Company, Detroit.
T. L. Watson, Schneider & Trenkamp Company, Cleveland, Ohio.
F. C. Shays, American Sheet Steel Company, St. Louis.
J. G. Beegle, Rochester Stamping Company and Robeson Cutlery Company, Rochester, N. Y.
C. H. Bishop, T. J. Nonne, C. Sidney Shepard & Co., Chicago.
G. W. Dana, George A. Fry, J. W. Jacobs, F. P. Haus, Charter Oak Stove & Range Company, St. Louis.
S. Y. Buckman, Henry Seagur, F. L. Sweeney, Berger Mfg. Company, St. Louis.
C. L. Hayden, W. H. Sawyer, Estate of P. D. Beckwith, Dowagiac, Mich.
W. A. Lockwood, Ringen Stove Company, St. Louis.
Edward J. Fox, Karl W. Pfeffer, Ralph Buck, Henry Hoerner, Bridge & Beach Mfg. Company, St. Louis.
F. A. Spielman, Buck's Stove & Range Company, St. Louis.
G. W. Simons, Hibbard, Spencer, Bartlett & Co., Chicago.
James T. Newell, *The Iron Age* and *The Metal Worker*, St. Louis.

NORTH DAKOTA RETAIL HARDWARE ASSOCIATION.

The fifth annual meeting of the North Dakota Retail Hardware Association was held in the Loyal Knights' Temple, Fargo, on February 19 and 20. The attendance was the largest in the history of the association and the meeting was profitable to all concerned. In addition to the members there were present representatives from many of the jobbing houses in the West and a number of manufacturing firms.

The meeting was called to order on Wednesday morning by President Helgesen and was addressed in a speech of welcome by Mayor Johnson of Fargo. After a reply by President Helgesen the following committees were appointed:

TRANSPORTATION: H. Harrington, Fargo; H. F. Emery, Fargo; C. N. Barnes, Grand Forks.
NOMINATIONS: H. F. Strehlow, Casselton; I. L. Newgard, Grafton; W. R. McIntosh, Bottineau.
RESOLUTIONS: H. S. Diesem, La Moure; H. N. Joy, Hamilton; C. A. Heegard, Mandan.
QUESTION BOX: H. B. Allen, Jamestown; H. H. Walters, Casselton; O. A. Gallup, Edgeley.

At the afternoon session H. P. Allen of Jamestown read an entertaining and instructive paper on "Fakes and Fakirs, or Leg Pulling," which was followed by a general discussion. H. F. Emery of Fargo then read an interesting paper on "Some of the Difficulties Which Hardware Dealers Have to Contend With."

At the morning session on Thursday President Helgesen read his annual address, which was an exceptionally able and interesting document. C. N. Barnes followed with his annual report as secretary.

At the evening session the following officers were chosen for the ensuing year:

PRESIDENT, H. N. Joy, Hamilton.
VICE-PRESIDENT, H. F. Emery, Fargo.
TREASURER, W. H. Pinkerton, Lakota.
SECRETARY, C. N. Barnes, Grand Forks.
EXECUTIVE COMMITTEE: Anton Enger, Cooperstown; Frank Lish, Dickinson; H. F. Strehlow, Casselton; I. L. Newgard, Grafton; H. Harrington, Fargo; W. W. Jamieson, Wahpeton.

The following delegates to the annual meeting of the National Retail Hardware Dealers' Association were chosen: H. N. Joy, Hamilton; H. T. Helgesen, Milton; C. N. Barnes, Grand Forks.

Papers were read on "One Way to Compete with Supply Houses," by O. A. Gallup, Edgeley; "Dealers' Associations, Their Effect and What They May Accomplish," by Jas. McPhail, Langdon, and "The Practical Hardwareman," by L. B. Hanson, Sheldon. Grand Forks was selected as the next place in which the next annual convention should be held.

Just prior to the final adjournment the convention, by a rising vote, put itself on record as greatly appreciating the valuable services rendered by retiring President H. T. Helgesen, who has so ably and efficiently conducted the affairs of the association during the past two years.

Letters From the Trade.

Defective Goods.

The following communication from a New York house touches on a question concerning which they desire suggestions from the trade:

Kindly present this question in the columns of *The Metal Worker* to decide an argument, viz.:

A dealer bought a combination plier, which was not warranted. He made a sale of it to a customer who tried it in his presence and it snapped in two while handling it. The dealer gave the customer another plier in place of it, and later on called upon the house he had bought it of to replace same, and they refused upon the ground that the article was not warranted. The dealer claims, notwithstanding the fact that the article was not warranted, that no matter how cheap the article is it is meant to be used a few times for the purpose for which it is intended, and when at the first attempt to make use of the article it breaks, that it is not even up to the standard of an unwarranted article, and should be replaced by the wholesaler. The wholesaler claims that when a buyer purchases a tool without any warranty he is supposed to assume all risks, and therefore declines to replace the article in dispute.

Keeping Track of Unfilled or Partly Filled Orders on Manufacturers.

We are in receipt of the following inquiry in regard to a good system in connection with the buying department for keeping track of all orders still unfilled or only partly filled. This is a matter of a good deal of general interest and we hope that the appeal of our correspondents will call out a liberal response from houses whose methods in this regard are satisfactory:

We are looking for a good method of ordering—some system whereby we could keep good track of all orders still unfilled or only partly filled. At present we are using the carbon sheet system, but these are handled so much that they go to pieces on the file, more especially in the last few years, when it has been so hard to get goods. Another objection to this is that in a large business these files are apt to get so bulky before they can be removed.

We will be very much pleased if you will take this up with some of your larger subscribers and let us have the information at your convenience.

Suggestions in Regard to Invoices.

The following communication is from a wholesale house in Pennsylvania, and suggests a change which, in their judgment, should be made in the location of the date of invoices:

We beg to offer a suggestion to the readers of *The Metal Worker*, and think it is entitled to consideration. It is that the date on an invoice head be so arranged that it will not be located at the top of the invoice. A great many dealers use the Shannon style of letter file, and the perforations invariably come where the date is, very often cutting out the day of the month, or the month itself when a figure representing the month is used.

Another thing: There should be a space on the invoice to enter customer's order number, as many dealers are now using number system of orders.

If you feel disposed to have this matter considered in your publication we shall be pleased.

Selling Goods on Installments.

A retail hardware house in Central New York send us a copy of a bill that has been introduced in the New York State Assembly providing for the licensing of dealers who sell goods on the installment plan, accompanied by the following comments:

It would seem to us that this bill, if made a law, would work great hardship on the many legitimate

stove, tinware, hardware and house furnishing goods dealers who sell goods on installments. This plan of selling goods is also a great help to the poor, who are enabled to furnish their homes by small payments. No doubt many of your readers would oppose such a measure, and, therefore, we would ask you to bring it to their notice.

The Stearns Adjustable Lawn Sprinkler No. 2.

E. C. Stearns & Co., Syracuse, N. Y., are offering the lawn sprinkler shown herewith. The quantity of the spray may be gauged by turning the adjustable cap on the screw. Sufficient tension to hold the cap firmly on the screw, it is shown, is furnished by a coiled spring, which at all times exerts an upward pressure against the bottom of the cap. The standard for holding the sprinkler upright in the ground is made of wire, pointed at the lower end, and cast into the body of the sprinkler, which is threaded to fit a standard ¾-inch hose connection, and is provided with an internal rubber packing. All visible parts of the sprinkler are finished in black enamel except the adjustable cap, which is of brightly polished non-rusting metal. It is explained that the lawn sprinkler is intended to meet the demand for an inexpensive sprinkler which will allow the water passing through it to cover a wide area of ground.



The Stearns Adjustable Lawn Sprinkler No. 2.

Gem Food Chopper, Butter Grinding Nut.

Sargent & Co., New Haven, Conn., and 149-153 Leonard street, New York, have added an extra cutter to the group of four steel cutters sent out with the Gem food chopper, which is designed to grind nuts of various kinds to the consistency of a butter. The other cutters of this chopper have apertures in the plates to regulate the degree of cutting—either coarse, medium, fine or pulverized—but, as will be seen by reference to the illustration herewith, there is no outlet in the No. 5 cutter other than at the periphery of the grinder, thus producing a smooth, pastelike mass, necessary in grinding of this character. This steel cutter, known as No. 5, is sent with either the No. 20 or No. 22 Gem food chopper, at no additional cost, and is particularly suitable for making peanut butter or grinding almonds or other nuts.



Nut Butter Cutter for Gem Food Chopper.

Rollman Food Chopper.

The Rollman Mfg. Company, Mount Joy, Pa., have just put on the market the Rollman food chopper No. 11, here illustrated. This machine is tinned, has steel cutters for fine and coarse cutting together with a nut butter cutter for producing a smooth paste like mass desirable in grinding peanuts, almonds, &c. It has a capacity of ½ pound of raw or cooked meat per minute, and is especially recommended by the manufacturers for chopping nuts of various kinds. The machine is practically in two parts. One movement releases the clamp, thus throwing the hopper wide open; the worm screw, handle and disks are likewise practically in one piece, with the other half of the shell completing the chopper, making it easy to get at and quickly cleansed. The company also have in course of preparation two larger sizes, which will soon be ready for the market, their capacity being respectively 1 and 2 pounds of meat per minute, and constructed on similar lines. The latter choppers will have a suitable groove underneath the split in the hopper to catch all the juices and lead them into the dish which catches the chopped meat, vegetables or fruit. The No. 11 size weighs but 18 ounces, and is designed to retail at 50 cents.

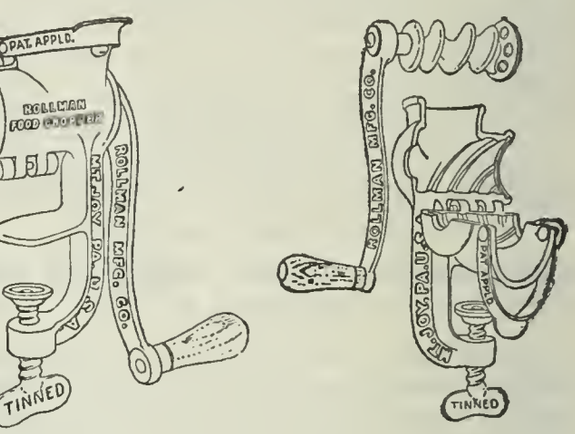


Fig. 1.—Rollman Food Chopper. *Fig. 2.—Chopper Open.*



Fig. 3.—Coarse, Medium and Nut Butter Cutters.

It is reported that the National Enameling & Stamping Company will discontinue their factory at Portland, Conn., and remove the plant to Brooklyn, N. Y. Considerable of the machinery has already been shipped to that city. The Portland plant, formerly operated by the Eastern Tinware Company, was established about ten years ago. Joseph Scheider was its manager until two years ago, when on its absorption by the National Enameling & Stamping Company the management was placed in the hands of Louis Haberman, a son of Vice-President Haberman. Mr. Haberman, it is said, will now become the manager of one of the other factories of the company. The Portland factory was the principal industry of that place, employing until a few weeks ago about 1000 men.

Stove and Hardware Dealers.

W. E. Everson, Union City, Pa., has favored us with a copy of the first issue of *Everson's Illustrated Hardware Bulletin*, which he has issued under date of February 1, 1902. The publication consists of a four-page circular, 12 x 9 inches in size, containing cuts and descriptive matter, together with prices, of the various lines of goods handled by Mr. Everson. These include the Majestic Ranges, Ruby and Germania Ranges and Stoves, New Process Oil Heaters, Plumbing Goods and Bathroom Fixtures, Flour and Spice Cabinets, Sewing Machines, Wash Boilers, Churns, Tea Kettles, Tea and Coffee Pots, Clothes Wringers, Pails and a variety of kitchen and household utensils. In a preliminary note Mr. Everson states that he proposes to present his *Bulletin* to the public on the first of each month. In addition to the articles named, he handles Hot Air Furnaces, Steam and Hot Water Boilers, Plumbing and Steam Fitting Supplies, Slate, Metal and Felt Roofing, Spouting, Tinners' Specialties, Bicycles, &c.

The Trotter Refrigerators, made by C. W. Trotter & Sons, 7 East avenue, Rochester, N. Y., form the subject of an illustrated blotter that is being distributed by that concern. In addition to their stock patterns, the company make special Refrigerators to order with white porcelain linings and icing from out of doors.

E. B. Fahrney, Waynesburg, Pa., formerly secretary and director of the American Mfg. Company, has purchased the patents and rights to the United States Cook Stove Fruit Drier from H. Rinehart and W. T. Omwake, assignees of the company named. We understand that Mr. Fahrney intends to make these Fruit Driers on an extensive scale and vigorously push them.

The Lawrence-Bostwick Mfg. Company, Phelps, N. Y., were recently incorporated for the purpose of making, among other things, the Bostwick Safety Thimble for stove pipes and hot air heating pipes, as well as a large number of useful household wares of tin and wood. The works will be equipped with the latest machinery, the buildings being those formerly occupied by the shoe factory in Phelps. The officers of the new concern are G. H. Parmalee, president; R. E. Connolly, vice-president; Dr. W. A. White, secretary, and John Bostwick, general manager.

C. E. Tyler has recently purchased the Stove, Range and Tinware business formerly conducted by F. E. Brockett, at 121 West Dominick street, Rome, N. Y. Mr. Tyler has been connected with the store for the past 12 years, and is thoroughly familiar with every detail of the business. We understand that the store will at once be rearranged and restocked with a complete line of Stoves, Ranges, Tinware and House Furnishing Goods, and that special attention will be given to furnace work and heating, as well as to copper, tin, sheet iron work and contracting.

R. R. Montgomery & Co. of Decatur, Ill., in an illustrated pamphlet which they are distributing describe their King Fly Killer, which is referred to as killing flies without crushing them. The device is made of wire netting, and in striking makes no breeze to blow the flies away, thus dispatching them easily and quickly.

Rankin & Mauck have succeeded Amos J. Rankin in the Hardware, Stove, Agricultural Implement and Buggy and Wagon business in Washington, Iowa.

Wm. J. H. Gluck, 218-222 North Gay street, Baltimore, Md., has sent us a batch of circulars calling attention to Watering Pots, Water Coolers, Ovens, Ice Cream Dishers, Nursery Refrigerators, Steam Cookers, Oil Heaters, Hot Plates, Tinware, &c.

E. Busket & Co. have lately engaged in business in Attica, Kan., handling Shelf Hardware, Stoves and Tinware, Sporting Goods, &c.

H. A. Le Roy Company have been incorporated with a capital of $25,000. They will conduct stores at Alexandria and Osakis, Minn., carrying a stock embracing Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c.

A new firm under the style of Phillips, Yarbrough & Allen have just bought out the stock of Hardware, Crockery and Stoves formerly carried by L. F. Dickson, Opelika, Ala. The stock is referred to as invoicing about $25,000. The new firm are composed of young men who have had considerable experience in the business. They request catalogues, quotations, &c.

Dayton & Vail are successors to C. O. Dayton in the Hardware and Stove business in Keota, Iowa.

Swinton & Co., Port Jervis, N. Y., are intending to add the sale of House Furnishing Goods, Wooden Ware, Novelties, &c., to their line, and will value catalogues, circulars, price-lists, &c., from the trade relating to these departments.

The postponed meeting of the Iowa Retail Hardware Dealers' Association will be held at Cedar Rapids on March 4, 5 and 6. The headquarters will be at the Grand Hotel. The programme will be the same as would have been carried out at Des Moines but for the dangerous spread of the smallpox in that city.

The Detroit Register Company, Detroit, Mich., have favored us with a copy of their illustrated catalogue and price-list for 1902, covering the various styles of Hot Air Registers and Ventilators manufactured by the concern. These are offered in black and white japan, electro plated, nickel, bronze, gold, silver and copper finish, also in solid brass, bronze and copper. The list includes a variety of handsome designs and in square, oblong, circular, semicircular and convex forms. Baseboard Ventilators, Sad Irons, Yankee Dampers, Stove Pipe Registers, Ash Pit Doors, and the Detroit Sink Bracket and Detroit Lawn Spray are other goods which the company are making; also the Detroit Hot plate, in one two and three burner sizes.

At the annual meeting of the Manitowoc Aluminum Company, Manitowoc, Wis., recently held, the following officers were elected: President, Henry Vits; vice-president, George Vits; secretary, William Pfleuger. The directors voted to increase the capital stock of the company from $20,000 to $50,000, this increase being decided upon in order that the company's factory might be materially increased in size and equipped with improved machinery, in order to keep pace with the enlarged demand for the concern's products.

H. E. Loving is moving his Stove and Tinware business to more commodious quarters corner of Augusta and Frederick streets, Staunton, Va.

Fire on February 14 completely gutted the main storeroom, office and basement of the Cash Hardware Store, Lewiston, Idaho. They were fully insured, however, and are assured of a satisfactory adjustment, which is now in progress. The matter of reconstructing and restocking will occasion some delay, but the concern will resume in all lines as speedily as possible. Their Farm Implement and Vehicle department was not injured, nor their stock of Nails, Wire, Pipe, Bar Iron, Sash and Doors and Wagon Wood Stock. Inasmuch as their office and its contents were entirely destroyed, they request manufacturers and jobbers to send catalogues and price-lists relating to Hardware, Tools, Builders' Material, Vehicles, Implements, &c.

What is regarded as a particularly clever engineering feat was consummated in New York City last week, when by the piercing of an immense bowlder 20 feet below the surface at the northwestern corner of Central Park the engineers of the new subway effected a junction of two borings of the tunnel with almost absolute precision. Work on one end of the great bores was begun at Lenox avenue and the other was started from Central Park West, 1725 feet of solid rock being cut through to accomplish the junction, which was made precisely as if the bore had been made by one continuous piece of tunneling.

A cement for marble is made from plaster of Paris soaked in a saturated solution of alum. This must then be baked in an oven and ground fine in a mortar. A small quantity should be used with water as plaster. It sets hard and may be rubbed down like marble and polished.

RETIREMENT OF RUSSELL W. M'KEE.

With the retirement of Russell W. McKee, for many years past the esteemed senior member of the well-known firm of Bruce & Cook, the metal trade of New York loses from its active list one of its oldest members—a man who, in the course of over half a century of business life, has secured for himself in a peculiarly large measure the confidence, respect and affectionate regard of a wide circle of friends, both in and out of the business world. As we reported in a recent issue, the copartnership of Bruce & Cook was dissolved by mutual consent on February 1, Mr. Kee. Elsey C. Cook and the Estate of I. R. Bruce withdrawing, the business being continued under the old style by a new copartnership composed of Spencer A. Jennings, Philander R. Jennings and Frank C. Jennings, nephews of the late John C. Cook, together with A. Gardiner Cooper, all of whom were members of the old firm.

It will afford pleasure to the many friends of Mr. McKee in all parts of the country to see the excellent portrait of this veteran of the trade which is presented herewith, and also to peruse the following brief sketch of his career:

Russell W. McKee was born on December 11, 1826, and is consequently in his seventy-sixth year. Coming, in 1846, to Brooklyn—which has ever since been his place of residence—he engaged in business in that city and in New York until 1855, when he entered the employ of the house with which he has been continuously identified for the long period of 47 years. At that date the tin plate and metal firm of John M. Bruce's Sons, as they were then styled, were reorganized, and John C. Cook, who had been an employee of the house, entered into partnership with Franklin W. Bruce, under the firm name of Bruce & Cook. Mr. Cook induced Mr. McKee, with whom he had come into close relations in mission work, in connection with the old Franklin Avenue Presbyterian Church of Brooklyn, to accept the position of bookkeeper with his firm. His success in his new field of labor was marked and he obtained rapid advancement in the business.

At first the business of Bruce & Cook was confined to the local trade in and near New York City, but the sphere of their operations was gradually extended, especially in the South, where the house did a large trade. Mr. McKee made many trips to the Southern States in the interest of his firm, both before and after the Civil War. At the time the war broke out Bruce & Cook had about $50,000 of outstanding accounts in the South. It speaks well for the estimation in which the firm were held by their Southern customers that they were able to collect of this sum 50 cents on the dollar at the close of the war. Mechanics were scarce and valuable in the South in those days. Consequently few of the firm's customers were drafted into military service, and they were in shape to resume business on the suspension of hostilities. Mr. McKee relates many interesting experiences of those stirring times. He was one of the two first civilians to enter the city of Richmond after its occupation by the Federal forces.

In connection with his early experience as a tin plate and metal salesman in New York City, it is interesting to note that he was the first to introduce ready made solder into the local tin shops, a line which has since become an important feature of the business of his house. The first solder was made in the basement of the firm's present quarters on Water street by Messrs. Cook and McKee themselves. It was only by persistent effort, however, that they succeeded in persuading the tinsmiths to use their material, as the latter were wedded to the solder of their own manufacture.

In 1868 Mr. McKee was admitted into partnership, and on the death of Mr. Cook, in 1892, he became the head of the firm of Bruce & Cook. To him is due in a large measure the success of the business and the enviable reputation which the firm have built up for faithful performance of obligations, courteous treatment and conscientious service of their customers and progressiveness in adopting every facility for the doing of business. Mr. McKee early adopted as his motto that of St. Paul, "Not slothful in business; fervent in spirit, serving the Lord." Out of his full and prolonged experience in business life he has analyzed the requisites for success into three elements—tact, push and principle. With these three, and ordinary intelligence, he believes that no young man can fail.

No sketch of his career would be adequate or characteristic of the man without a reference to his numerous activities in the sphere of religion and philanthropy. During the whole of his life he has been an active church worker, and at present holds the office of elder in the Throop Avenue Presbyterian Church of Brooklyn. For a long period of years he has conducted, in connection with that church, a large Bible class for young men. His instruction and advice have been of incalculable value to many men who have passed under his influence in that class and have since attained leading positions in various walks of life. To Sunday school work he has given especial attention. He is, at the present



RUSSELL W. McKEE.

time, president of the Brooklyn Sunday School Union, with which he has been connected for the last 40 years. His activities in this field extend well beyond his own city, he having held prominent positions in the New York State Sunday School Association, and he is still as actively interested as ever in the work. He is a strong supporter of the Young Men's Christian Association, a director of the New York Port Society and a friend and benefactor of many lines of religious and charitable effort. He is also an ex-president of the Society of Old Brooklynites, and has been connected with a number of other associations.

Mr. McKee's retirement from active business life now gives him the opportunity to devote all his energies to work for others. It will be a pleasure to his many friends to know that he still retains his desk in the office of Bruce & Cook, and, while not connected with their business, is constantly to be found at his old post, which he uses for the discharge of his philanthropic work.

A pleasant ceremony marked the retirement of Mr. McKee from the firm, when, on Friday, January 31, the last day of his connection therewith, he was presented with the handsome silver loving cup of which we present an illustration. The cup is of massive workman-

ship, with three handles, and bears the following inscription:

Presented to
RUSSELL W. McKEE
by his Partners and Employees as a testimonial of their regard and in remembrance of forty-seven years' association with the firm of
BRUCE & COOK.
1855. January 1. 1902.

On the other sides of the cup are engraved views of the Bruce & Cook buildings, on Water street and on Pearl street.

This token of the esteem and affection in which Mr. McKee is held by those who have been most closely associated with him was presented in a graceful speech by P. R. Jennings. The recipient, in response, expressed his heartfelt appreciation of the gift and of the motives which had suggested it.

It is with peculiar pleasure that *The Metal Worker* takes the opportunity of presenting this sketch of one of its earliest and most faithful friends. Indeed, Mr. McKee may be said to have been one of the godfathers of this paper, for it was largely through his suggestion that the idea of publishing a paper that would subserve the interests of the rank and file of tradesmen in the lines



Loving Cup Presented to Russell W. McKee.

which this paper covers was adopted. The familiar advertisement of Bruce & Cook, which appears on the back cover, was the first advertisement received, and it has stood in the same position ever since the initial issue of *The Metal Worker*, in January, 1874. This was, moreover, the first trade paper in which the concern in question ever advertised. Mr. McKee has been a constant reader of the paper throughout the 28 years of its existence, and it has ever found in him a sympathetic friend and supporter. *The Metal Worker* desires to tender to him its most cordial wishes for many years of health, happiness and usefulness in the community in which he lives, a sentiment that will be echoed by a host of friends in the trade.

Tin Plate Drawback Paid in 1901.

Figures have just been published by the Bureau of Statistics giving in detail the amounts of drawback paid by the United States on imported articles withdrawn from warehouses and used in the manufacture of articles exported during the fiscal years ending June 30, 1900 and 1901. Tin plate, of course, is the most important of all of the articles in which the foreign material is worked up in this country for re-export to foreign countries. In the fiscal year ending June 30, 1900, there were imported into the United States 125,269,156 pounds of tin plate, by far the largest quantity, 92,240,909 pounds, going into New York, 18,991,648 pounds into Philadelphia, 10,178,234 pounds into San Francisco, and 2,429,537 pounds into Chicago. The total amount of drawback paid was $1,848,792. In the fiscal year ending June 30, 1901, the quantity was slightly larger, being 127,261,883 pounds. Of this New York is credited with 101,174,989 pounds. Philadelphia with 10,517,444 pounds, San Francisco with 11,339,927 pounds and Chicago with 2,692,732 pounds. The total amount of drawback paid is $1,889,823.

Question of Gauge of Galvanized Sheets.

A controversy, says our London correspondent, is at the present moment taking place upon the question of the gauge of galvanized sheets. An English firm, having bought a parcel of galvanized iron, tested the weight according to official tables given in the *Ironmonger* diary for 1902. Finding that the weight for a given gauge and dimension did not tally with the weight stated in the invoice, they inquired as to the actual trade custom. One authority states, "If a buyer asks for 24-gauge galvanized iron, we should assume that he meant iron which, in its galvanized condition, was of 24 gauge, and that is what we should deliver." Another firm, however, say that their custom is to sell sheets which in the black are fully the thickness of the gauge specified. From inquiries made by the *Ironmonger* this latter course appears to be the general practice, especially among the larger makers. It would thus seem that there is no fixed rule in England governing the gauge, so that when buyers require sheets of a certain gauge it is necessary to state in the order whether the thickness refers to the material before or after galvanizing. American exporters would do well to make this point quite clear to their foreign buyers, particularly in the Australian market.

New Sheet Metal Workers' Alliance.

A meeting of the journeymen sheet metal workers of New York, Brooklyn, Philadelphia, Pittsburgh and Chicago was held in Pittsburgh last week, for the purpose of organizing a new association. Members of the trade in these large cities refused to affiliate with the existing National Association of Sheet Metal Workers, alleging that, in the present conditions of work, the differences between large cities and small towns are too great to allow of their submitting themselves to the limitations placed on the workmen in the smaller communities. The new association proposes to allow each and every union to fix its own wage rates. New York and Brooklyn workmen receive wages at the rate of 42½ cents an hour, while Philadelphia and Pittsburgh journeymen receive 37½ cents an hour. The convention decided to form a national alliance of the local unions of the cities above named. The membership in these unions now numbers about 7000. The action of the convention is subject to the approval of the local unions, and a vote will be taken when the delegates make their reports.

It was decided to name the new organization the Sheet Metal Workers' National Alliance of America. The officers chosen are: C. D. Wheeler of Chicago, president; John C. Steveline of Philadelphia, first vice-president; M. O'Sullivan of Pittsburgh, second vice-president, and Mervyn Pratt of New York, secretary.

Bishop's Eave Trough End Former.

The ingenious device manufactured by G. E. Bishop, Dowagiac, Mich., for closing the end of an eave trough, which has now been on the market for some years, is constantly growing in popularity among tinners. The tool closes the end of an eave trough in corrugations. This makes an eave trough frost proof and also gives a neat finish to the end of the trough. It avoids the use of any additional material to that contained in the metal of the eave trough itself. The device can be had from any jobber or from the manufacturer.

JAMES E. KELLEY & SON, New Haven, Conn., will do the gravel roofing in connection with the new building which the John S. Osborn Company are erecting in Allingtown for the Lion Brewery.

Pattern for a Y.

A correspondent from Milwaukee wishes to know how to cut the patterns for a Y for blow piping, sketch of which is shown in Fig. 1. In this A B C D E F G is the elevation of the Y, the vertical hight being 2 feet 4 inches, the lower openings 16 and 22 inches, while the top opening is 25 inches. H E shows the joint between the Y. I J K L in plan shows the true section on A B in elevation, while M N O P and R S T U show the true sections, respectively, on G F and D C in elevation.

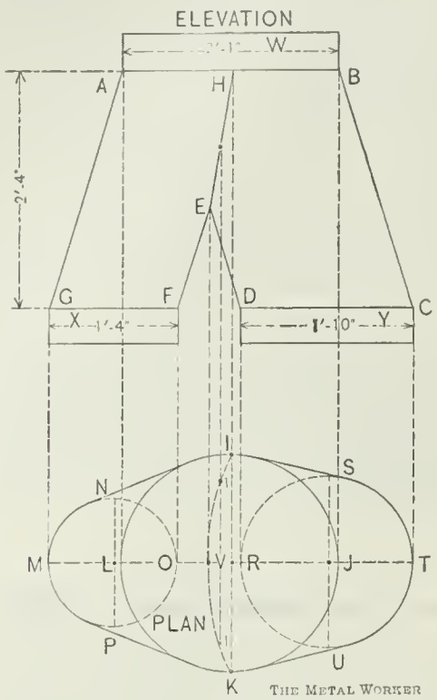


Fig. 1.—Plan and Elevation.

Draw lines in plan from N to I, I to S, U to K and K to P, which complete the plan of the Y when viewed from the top. Collars W, X and Y in elevation are put on separately.

The first step is to obtain a true section on E H in elevation, for which proceed as follows: Draw the vertical line H E in Fig. 2, equal to H E in elevation in Fig. 1. At right angles to E H in Fig. 2 draw the line K I, making H I and H K equal to V I and V K, respectively, in plan in Fig. 1. Then through the points K, E, I in Fig. 2 draw a section at pleasure, as shown. Then will K E I be the true section on E H in elevation in Fig. 1.

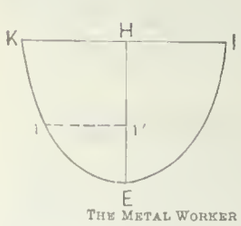


Fig. 2.—True Section on H E in Elevation, Fig. 1.

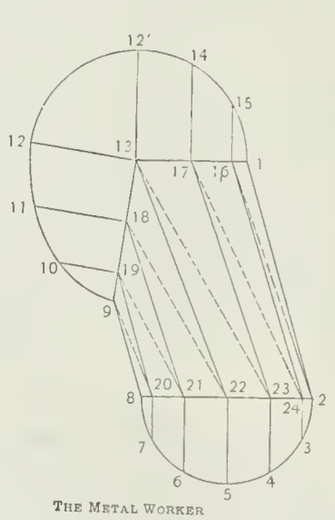


Fig. 3.—Obtaining Measurements for Sections.

If for any reason the miter line in plan is required on H E in elevation, it can be obtained by establishing any point, as 1 in K E in Fig. 2. From 1, and at right angles to H E, draw a line intersecting the line H E at 1'. Now take the distance of H 1' and place it as shown by H 1' on H E in elevation in Fig. 1. Then from H in elevation, and at right angles to A B drop a line intersecting the plan of the top at I and K. From E drop a vertical line intersecting the center line M T in plan at V, and from 1' in elevation drop a line as shown by 1' 1. Now set the dividers equal to the distance 1 1' in Fig. 2 and set off this distance on either side of the line M T in plan in Fig. 1 on the line 1' 1, thus obtaining the points 1 and 1. Then through the intersections I, 1, V, 1, K trace a line, as shown, which will represent the miter line in plan on H E in elevation.

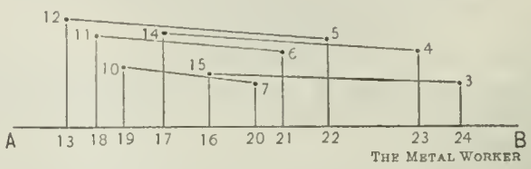


Fig. 4.—Sections on Solid Lines in Fig. 3.

The patterns for the two arms will be developed by triangulation, but before obtaining the patterns it will be necessary to construct a diagram from which the measurements can be obtained for the sections with which to develop the patterns. Therefore in Fig. 3 let 1 2 S 9 13 be a reproduction of B C D E H in elevation in Fig. 1. Now take a tracing of the half profile T U R in plan and place it as shown by 2 5 8 in Fig. 3. In similar manner take a tracing of I V J, the quarter circle in plan in Fig. 1, and place it as shown by 12' 13 1 in Fig. 3. Finally, take a tracing of the half section K H E in Fig. 2 and place it as shown by 12 13 9 in Fig. 3. Now divide the half section 1 12' 13 into equal spaces, as shown by 15 and 14; also the section 12 13 9 into the same number of spaces, as shown by 10 and 11. As these two sections contain six spaces, then divide the half section 2 5 8 into six spaces, as shown by 3, 4, 5, 6 and 7. Now at right angles to 1 13 and from points 15 and 14 draw lines intersecting the line 13 1 at 16 and 17. At right angles to 13 9 and from points 10 and 11 draw lines intersecting the line 9 13 at 19 and 18; then, finally, at right angles to 2 8 and from points 3, 4, 5, 6 and 7 draw lines intersecting the line 2 8 at 24, 23, 22, 21 and 20. Next draw solid lines from 16 to 24, 17 to 23, 13 to 22, 18 to 21 and 19 to 20, and dotted lines from 16 to 2, 17 to 24, 13 to 23, 18 to 22, 19 to 21 and 9 to 20.

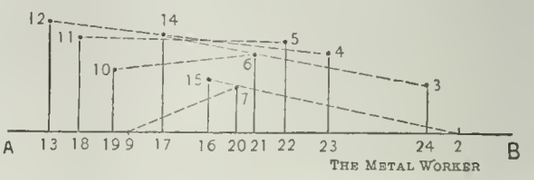


Fig. 5.—Sections on Dotted Lines in Fig. 3.

These solid and dotted lines represent the bases and the lines in the sections the altitudes with which to construct the sections, as follows: In Fig. 4 draw any horizontal line, as A B, upon which place the various lengths of the solid lines in Fig. 3, as shown by lines having similar numbers in Fig. 4. For example: Take the length of the solid line 13 22 in Fig. 3 and place it as shown by 13 22 on the line A B in Fig. 4. At right angles to A B and from points 13 and 22 draw the lines 13 12 and 22 5, equal in hight to 13 12 and 22 5 in Fig. 3. Draw a line from 12 to 5 in Fig. 4, which represents the true length on line of similar number in Fig. 3. In this way all of the sections on solid lines shown in Fig. 4 are obtained.

In precisely the same manner as described in connection with the section on 13 22 in Fig. 4 construct the diagrams on dotted lines in Fig. 3, as shown by sections having similar figures in Fig. 5.

For the pattern shape draw any vertical line, as 1 2 in Fig. 6, equal to 1 2 in Fig. 3. Now, with 1 15 as radius and 1 in Fig. 6 as center describe the arc 15. Then, using 2 as center and 2 15 in Fig. 5 as radius, intersect the arc 15 in Fig. 6, as shown. Now, using 2

as center and 2 3 in Fig. 3 as radius, describe the arc 3 in Fig. 6, which intersect by an arc struck from 15 as center with a radius equal to 3 15 in Fig. 4. Proceed in this manner, using alternately as radius first the divisions in the profile 1 13 12′ in Fig. 3, then the length of the dotted lines in Fig. 5, the divisions in the profile 2 5 8 in Fig. 3, then the length of the slant lines in Fig. 4, until the line 12 5 in the pattern is obtained. Then use the divisions as radius in the section 9 12 13 in Fig. 3, the dotted lines in Fig. 5, the divisions in 2 5 8 in Fig. 3, then the slant lines in Fig. 4, until the line 8 9 is obtained. Trace a line through intersections thus obtained in Fig. 6; then will 1 2 8 9 12 be the half pattern.

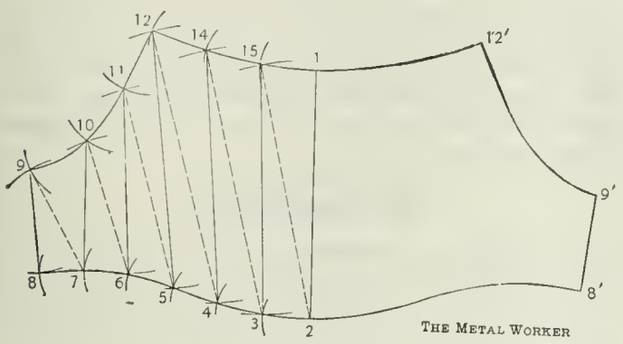


Fig. 6.—The Pattern Shape.

Trace the other half opposite the line 1 2, as shown. Then will 8 2 8′ 9′ 12′ 1 12 9 be the full pattern for the arm shown by B C D E H in elevation in Fig. 1, with seam at E H.

In precisely the same manner obtain the pattern for the arm E F G A H. On the line G F place the half section O P M in plan, on H E in elevation place the half section H I E in Fig. 2, while on A H in elevation in Fig. 1 place the quarter section V L I in plan. When the sections are all in place proceed as shown in connection with Figs. 3, 4, 5 and 6, being careful to have the seam at the shortest end, as at E H in elevation in Fig. 1. After the Y has been seamed or riveted together the collars W, X and W are joined separately.

A New Tin Plate Process.

Edwin Norton, president of the American Can Company, has recently patented a new process for the rolling of tin plate. The leading feature of the invention is to change the direction of rolling twice instead of once during the reducing operation.

Mr. Norton says in his patent specification, as quoted in *Tin and Terne*, that after the initial process of rolling the steel ingot into a tin plate bar, all the rolling is done in the same direction—*i. e.*, in the width of the tin plate bar, and that this successive and continual rolling in the same direction injures the strength and quality of the metal and causes the finished product of thin sheets or plates to have too little coherence, strength and tenacity except in a direction across the grain or fiber of the metal produced by such continuous rolling in one direction. Also, the rolling by the present method involves the repeated handling and passing between the rolls of very small rolling units, starting with the tin plate bar of a width of only, say, 8 inches. This involves substantially as much labor as would the handling of much larger rolling units.

It is stated to be the object of the invention to overcome the difficulties mentioned and produce a sheet of much better quality as to ductility, strength and toughness. The process consists of the following steps:

1. Rolling the ingot, of any convenient weight and dimensions, into what may be called a "wide billet bar" about 20 inches wide by about 1.808 inches thick and 30 to 40 feet long, according to the weight and size of the ingot. The width dimension is preferably one of the dimensions of the singles or of the finished product.

2. Shearing this wide billet bar, with its initial heat, into pieces 20 x 28 inches and 1.808 inches thick.

3. Rolling these pieces, with their initial heat, in the cross direction from that of the previous rolling—*i. e.*, in the 20-inch way—into thin bars, say 28 x 80 inches, making them about 0.45 inch thick, passing the pieces back and forth between reversing rolls, so that the rolling action is alternately in opposite directions.

4. Continuing the rolling of these wide thin bars at the same initial heat and in the direction of their length into a long wide thin plate about 28 inches wide and 34 feet long, and about 0.1 inch thick. This final rolling action at the initial heat reduces the ingot to the thickness of the singles, and is preferably performed by a continuous train of five stands of rolls. The product of this operation is called for convenience "singles plate."

5. Shearing the wide thin singles plate thus produced into singles ready to match, the size being 20 inches net or 20¼ inches, to allow for scrap, by 28 inches by 0.1 inch thick.

6. Matching the singles, reheating and further rolling in pairs or packs of two in the cross direction from the last previous rolling—*i. e.*, in the direction of the length of the singles—extending the length of the pair to 56 inches, the width remaining 20 inches net.

7. Folding or doubling the pair, reheating and again rolling in packs of four, thus again doubling the length to about 56 inches net.

8. Finally, again doubling, reheating and rolling in packs of eight thicknesses until the sheets are reduced to the required gauge, their length being again doubled to about 56 inches, or twice the length of the finished product, in case sheets 20 x 28 are being rolled, as has been supposed in describing the process.

It is pointed out that by this process the steel is reduced to a thickness of 1-10 inch with the initial heat, thus saving one reheating and the direction of rolling is changed twice instead of once.

Foot Warmers.

BY B. WOODS.

Notwithstanding the advances made in the method of heating buildings from the time of Benjamin Franklin's open stove, the foot warmers of his day are still in demand by those who have occasion to drive teams during the severe winter weather. Having seen a suggestion in *The Metal Worker* a few years ago that a tin vessel, arranged with a can screw for filling and emptying, and of a suitable shape to be used in a wagon, could still be sold by the enterprising tinsmith for use as a foot warmer, I decided to make some up of these articles last fall and am pleased to report that they have met with a good sale. Hot water for filling them can be had not only at the start of the journey, but, in case of necessity, at any house along the road, and if the foot warmer is made to hold a sufficient quantity and is wrapped up in a blanket, the heat given off will add substantially to the comfort of the driver for a long time. I have made these foot warmers of one and two cross tin, according to their size, and in size 10 inches wide on the bottom and from 14 inches to 2 feet long. I formed them slanting on the top, so that they would be 1½ inches high on the front and as much as 5 inches high on the back. I was careful to secure large can screws, so that they could be readily filled from a teakettle. In the larger and longer sizes I soldered braces on the inside before putting on the ends, which were double seamed on.

British Tin Plate Exports Increasing.

Our London correspondent reports the exportation of tin plates from Great Britain in the month of January as follows: The exports of tin plates during the month of January to the United States showed a large increase both in volume and value, 7977 tons, compared with 4673 tons in January of last year, and valued at $540,000, compared with $300,000 during the same period last year. The exports of tin plate to Russia during the month of January have been 4075 tons, compared with 3124 tons last year, and valued at $275,000, compared with $170,000 in January last year. Owing to these unusually large consignments the tin plate trade has been busy. Another important feature of the tin plate trade is the increase in the amount of plates sent to small unenumerated countries, 4892 tons, valued at $340,000, the largest monthly export of tin plates for some years past.

The Auld & Conger Company.

The firm of Auld & Conger, Cleveland, will be succeeded by the Auld & Conger Company, a corporation organized under the laws of Ohio, with a capital stock paid in of $150,000. The Board of Directors and officers of the new company are as follows: D. Auld, Jr., president; J. W. Conger, vice-president and treasurer; D. E. Reynoids. secretary. W. D. Jones, T. A. Parker, F. H. Conger and L. M. Auld, with the above named officers, form the Board of Directors. This will involve no change in the management, as the change was made for the purpose of allowing a number of old employees to become interested in the business. The firm of Auld & Conger have been in existence since 1869 without a change of any kind in the firm name, being the oldest firm in the United States engaged in the manufacture of roofing slate and other slate products. In fact, the partnership has existed since 1862, for, while in the army, both members of the firm served in the same regiment and company for four years during the Civil War. The old firm bespeak the same liberal patronage for the new company that the old firm received.

McKeesport Tin Plate Company.

Several months ago some prominent capitalists of McKeesport, Pa., organized the McKeesport Mfg. Company for the purpose of building a large tin plate plant. It has recently been decided to change the name to the McKeesport Tin Plate Company, and a site for the new plant has been selected at Port Vue, just across the Youghlogheny River from McKeesport. The plant will contain ten mills, and contracts for the buildings and nearly all the equipment have been let. The company have acquired 14 acres, having direct connection with the Pittsburgh, McKeesport and Youghlogheny division of the Pittsburgh & Lake Erie Railroad. The hot mill building will be 60 feet wide and 350 feet long. It will be of steel frame construction, particular attention being given to light and ventilation. There will be two leantos, one 25 x 350 feet and one 15 x 350 feet. This main building will contain ten hot mills, sheet and pair furnaces, modern shears for cutting bars and delivering same to heating furnaces for rerolling and finally to the hot mills. The building will be commanded by two 15-ton electric traveling cranes, furnished by Whiting Foundry & Equipment Company of Chicago. The annealing and cold roll building will be 75 x 350 feet, equipped with two double annealing furnaces, built by the Forter-Miller Engineering Company of Pittsburgh, and ten stands of cold rolls. This building will also be commanded by two 15-ton electric traveling cranes, furnished by the Whiting Foundry & Equipment Company. The machine shop will be 40 x 50 feet in size and will be equipped with modern iron working tools throughout. The engine room will be 40 x 100 feet, and will contain two hot mill engines each 28 x 60 inches, to drive ten stands of hot rolls, one engine, 28 x 48 inches, driving ten stands of cold rolls, both furnished by the Bass Foundry & Machine Company, Fort Wayne, Ind. The tinning house will be 50 x 220 feet and will contain 19 tinning sets of modern type. The assorting and stock room will be 50 x 360 feet and will be used for assorting and trimming and also for storage. The boiler house will be 25 x 125 feet, seven batteries of Sterling boilers, each of 300 horse-power, giving a total of 2100 horse-power water tube boilers. The electric light and power plant will consist of two 150-kw. generators, driven by a Harrisburg Ideal engine, 18 x 18, furnished by the Harrisburg Foundry & Machine Company. The hot and cold stands of rolls, squaring and double shears and bar shear will be furnished by the Wheeling Mold & Foundry Company of Wheeling, W. Va., who have recently erected large foundry and machine shops for turning out sheet and tin mill equipment. The contract for the steel buildings has been given to the Fort Pitt Bridge Company, Canonsburg, Pa. The McKeesport Tin Plate Company have, we are advised, ample capital, and it is intended to make this plant a modern one throughout. The very best equipment is being provided. The plant will be operated throughout by electric motors, with the exception of the hot and cold mills.

The management of the plant will be under the direction of E. R. Crawford, who for 14 years was connected with the United States Works of the American Tin Plate Company, at Demmler, near Pittsburgh; also J. E. Lauck, who was originally with the Star Tin Plate Company, in Pittsburgh, and later at the United States Works of the American Tin Plate Company. It was under the direction of Mr. Lauck that the United States Works were rebuilt and enlarged and a number of new mills added. Both of these gentlemen will bring a wide experience in the manufacture of tin plate to the new company. It is intended to push work on the new plant as fast as possible and the concern hope to be making tin plate by next October. The output of the plant will be from 1200 to 1500 boxes per day. Plans for the building and equipment were made by S. Diescher & Sons, consulting engineers, Hamilton Building, Pittsburgh. This will be one of the largest tin plate plants in the country.

FLASHINGS.

On Thursday a meeting was held in New York of the presidents of the constituent companies of the United States Steel Corporation. At this meeting plans for needed improvements and additions to the works of the companies were presented and discussed. Large sums in the aggregate are involved.

E. H. Friedrich, Holyoke, Mass., has the contract for the roofing and copper work in connection with the addition to the plant of the Dean Steam Pump Company.

It is reported that C. H. Curtis and E. J. Strong, who organized the Curtis Sheet Steel & Corrugating Company of Zanesville, Ohio, have sold out their interests in that concern.

The Youngstown Iron, Sheet & Tube Company have bought a tract of iron ore property on the Mesaba range of 80 acres, and have leased two other properties near Eveleth.

G. M. Hayes, Columbus, Ga., informs us that he would be glad to receive catalogues from houses manufacturing Metal Ceilings, Metal Shingles and Cornices.

F. R. Phillips & Sons Company of Philadelphia have recently opened an office at 339 Fifth avenue, Pittsburgh, where F. Rees Phillips will be permanently located. They find this necessary to take care of their largely increased business in that section. They have of late taken several contracts for Sheet and Tin Mills, Machinery, Chilled Rolls, &c. In connection with their foreign business, they have imported considerable Steel of late and placed orders for a very large tonnage, principally for Eastern mills. With their Pittsburgh office they will be in a position to deal directly with Western mills.

The new heating furnaces at the Falcon Works of the American Tin Plate Company, Niles, Ohio, are said to be working very successfully. The furnaces were designed by William Banfield, district manager, and William Dixon, and show a saving in fuel of about 50 per cent. They heat the iron more uniformly without causing scale. All the furnaces at the Falcon works will be changed to this style. More Black Plate is used at the Falcon works than the hot mill capacity will provide, and for this reason Black Plate is sent to this plant from other works of the American Tin Plate Company. The Falcon works contain six mills, and it is not intended to increase their number at this time.

It is probable that the Youngstown Iron, Sheet & Tube Company, Youngstown, Ohio, will again increase their capital stock $1,000,000 or $1,500,000. It is stated that it is the intention of this concern to put up structural mills to roll Beams, Channels and other shapes. In the inception of this concern the capital stock was $800,000, but it has been increased a number of times and is now $4,000,000.

We are advised that the statement that the General Fire Proofing Company, recently organized in Youngstown, Ohio, would work very closely with the Youngstown Iron, Sheet & Tube Company, and would buy the

greater part of their raw material from that concern, is untrue. The General Fire Proofing Company are a separate and distinct concern from the Youngstown Iron, Sheet & Tube Company in every way, and will buy their material in the open market wherever they can do so to best advantage.

James O'Connell and Michael O'Dowd have entered the tinsmithing and furnace business, at Terre Haute, Ind.

John P. McCrea, late with L. & R. Wister Company, representing the American Sheet Iron Company, has secured an engagement in the sales department of the American Sheet Steel Company and is located in their New York offices, Battery Park Building.

The various lodges of the Amalgamated Association have begun the election of delegates to the annual convention of the association, which meets in Wheeling, W. Va., on April 15. The time for the election of delegates extends until March 1. At Wellsville, Ohio, where the lodge of the Amalgamated Association suffered considerably through desertions, occasioned by the strike last summer, a special effort will be made to renew interest in the organization.

The American Can Company have decided to establish a Tin Can factory in Denver, Col. The company absorbed the factory of the Eaton-Ritchell Company, at Denver, but this factory was burned last summer. Since that time Denver consumers of Tin Cans have been obliged to purchase their supplies from Eastern factories. It is stated that the new factory will be in charge of Edward C. Ritchell, and that it will be of large capacity to meet the requirements of the local packing, provision and fruit canning companies.

The Lalance & Grosjean Mfg. Company have started a fine foundry at their Tin Plate mills, at Harrisburg, Pa. The department was constructed under the personal direction of J. P. Luce, the manager, and has been warmly commended.

The limit of time for making suggestions for the schedule of work for the convention and changes in the scale of the Amalgamated Association for the Wheeling convention, in May, closed last week. The lodges of the association have been prompt in sending in their suggestions.

A meeting of the stockholders of Follansbee Brothers Company of Pittsburgh, manufacturers of and dealers in Tin Plate and Metals, will be held in that city on April 21 for the purpose of voting on a proposed increase in the capital stock of the concern from $300,000 to $800,000. The increase in capital will be used in developing the business of the concern, and also for the building of a plant to contain four Sheet and four Tin mills, which will likely be erected in the Pittsburgh district.

It is said that the independent Sheet manufacturers, at their meeting last week in Pittsburgh, decided to send a commissioner to England and Germany to buy sheet bars. A number of the independent Sheet mills have found their operations seriously hampered of late by inability to secure a sufficient supply of steel, owing to the shortage of billets and bars.

Wm. P. Price, James E. Mister, Jos. P. Price and others have incorporated the Price-Mister Can Company, at Baltimore, Md., for manufacturing Tin Cans, &c., with a capital of $3000.

It is understood that the H. J. Heinz Company have placed an order with the American Can Company for their supply of Tin Cans for a year. Specifications on this contract will be about 1,000,000 Cans a month, and the cost, according to average prices that the ordinary consumer of Cans must pay, would be nearly $250,000.

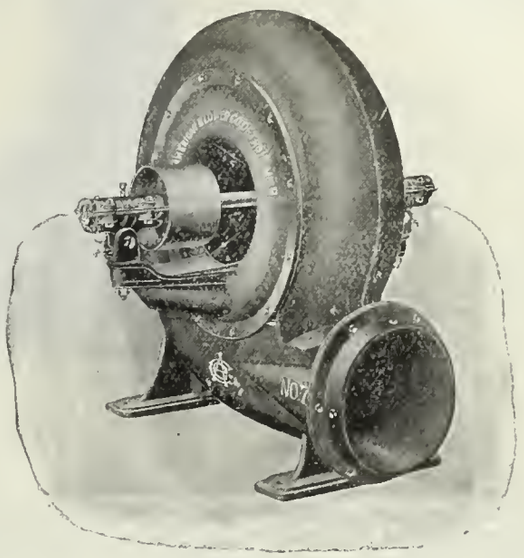
Charles A. Conklin and John N. Goddard are the incorporators of the Conklin Tin Plate & Metal Company of Atlanta, Ga., with a capital of $60,000. The company will deal in Tin Plates, Metals, &c.

The Southern Metal Company, Orangeburg, S. C., recently incorporated, have begun the manufacture of Steel Ceilings, Galvanized Iron Cornices, Light Wrought Iron Work, &c., and will, in addition, manufacture Sheet Iron Heaters and Tin Wares.

"A B C" Volume Blowers and Exhausters.

The accompanying cuts illustrate one of the latest lines of "A B C" volume blowers and exhausters, made by the American Blower Company, Detroit, Mich. The usual distinction between a "blower" and an "exhauster" obtains—viz., the blower has inlets on both sides, as shown in Fig. 1, while the exhauster has but one inlet, as shown in Fig. 2.

The shell, Fig. 3, is cast in one piece. The side plates, Fig. 4, are removable and reversible, a feature of great



The "A B C" Volume Blowers and Exhausters.—Fig. 1.—A Blower.

value, making it possible to suspend the fan from the ceiling or bolt it to a wall or partition, the plate on the side being reversed so as to bring the boxes into their original position. In the case of the exhaust fan, it is only a few minutes' work to change it from a right to a left hand fan, as the side plates are also interchangeable.

The circular side plates, above referred to, are larger in diameter than the fan wheel, so that the latter may be removed without taking the whole fan to pieces, as shown in Fig. 5. The wheel consists of a malleable iron

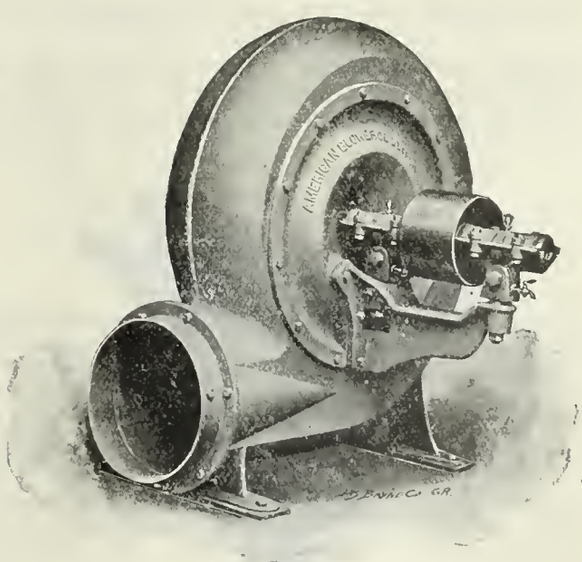


Fig. 2.—Left Hand Bottom Horizontal Discharge Exhauster.

hub, with malleable iron spiders, to which are riveted steel plate blades.

Special attention is called to the bearings, Fig. 6. They are lined with babbitt metal, bored out smooth and true. A feature introduced in this bearing is the forged vertical pin and the journal box knee. This device makes the bearing self aligning in all directions, without loosening a bolt or nut, and insures an absolutely cool running

bearing under any condition. They are provided with large oil chambers. The oil is carried up to the shaft by means of a ring, and then flows back to the oil chamber. Provision is made for drawing it off at the bottom of the box when it becomes thick from use.

The proportions of inlet to outlet, of blade area to

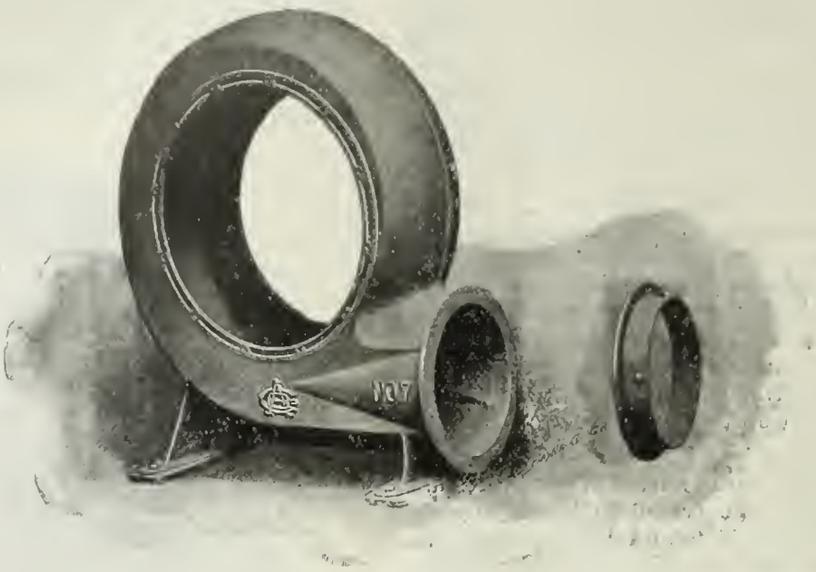


Fig. 3.—The Shell.

both of these and of the case to the whole are such as to give the highest efficiency obtainable in this class of machines. This type of blower is especially adapted for



Fig. 4.—The Side Plate.

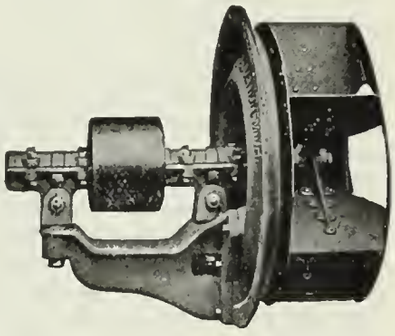


Fig. 5.—Fan Removed From Shell.

supplying draft to boilers, for blowing forges and furnaces and for use in connection with the various mechanical stokers. The exhauster is specially adapted for

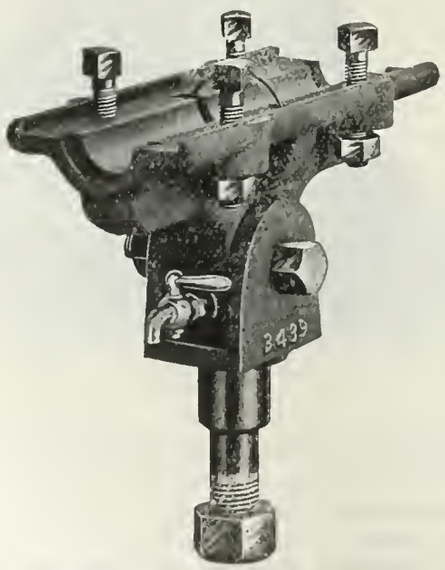


Fig. 6.—The Fan Bearing.

exhausting dust from emery wheels and grinding machines, as the cast iron case resists the wearing action of the dust and grit.

Manhattan Master Plumbers' Dinner.

The dinner given at Shanley's on Wednesday evening of last week by Manhattan Branch of the Master Plumbers' Association of New York City to Superintendent of Buildings Perez M. Stewart was probably the most successful and enjoyable banquet ever given by that organization. Among the guests present were Hon. Jacob A. Cantor, president of the borough of Manhattan; ex-Sheriff Dunn, Judge Julius M. Mayer of the Court of Special Sessions, Col. Abe Gruber, Superintendent of Highways Collins, Chief Plan Clerk Lee of the Tenement House Department, former Water Commissioner Dalton, and former Superintendent of Public Buildings Donovan. President A. H. Brown acted as master of ceremonies.

In the course of his remarks Superintendent Stewart said that he trusted the plumbers would think as well of him at the end of his term as at the beginning. He also remarked that this dinner was the only ray of sunshine that had crossed his path so far in his administration, and that the plumbers were the only building trade organization that had visited him. Col. Abe Gruber said he never thought he would live to see the day when plumbers would ever give anything away, but this dinner proved that he was wrong. He then recited the following poetical effort:

"It is hard to believe, said Morgan to Gould,
That no master plumber has ever been fooled;
Their knowledge of water and art in a pinch,
Has given them all a 'lead pipe cinch.'
While others may bite at our bonds and our stocks,
The plumber has put his good money in his socks."

"Tom" Dunn followed with observations based on his acquaintance with Tammany Hall, "Goo-Goos" and Republicans.

Judge Mayer, former National Presidents Malcolm, Byrns and Mitchell, Superintendent Collins, James Muir and others also spoke.

Flint & Walling Mfg. Company, Kendallville, Ind., manufacturers of the well-known Star Wind Mills and Water Supply Goods, have found it expedient to concentrate the business interests and management of their Eastern, domestic and foreign trade, and have recently opened an office at Room 1, 76 Broad street, New York. C. S. Geauque, who was formerly manager of this company's office at Philadelphia, and who is thoroughly conversant with the line, has the management and control of the new office. This change was found absolutely necessary in order to more fully meet the requirements of customers, both at home and abroad, and it is the intention of this company to work the trade vigorously the ensuing year. Any information desired pertaining to this line will be promptly furnished by addressing the company at their new office.

A LOUNGING CHAIR MADE OF PIPE.

BY MARTIN L. KAISER.

The porch chair shown in Fig. 1 is made of old ½-inch wrought iron water pipe aud fittiugs, and should cost the mechanic nothing, except for the canvas and for the bolts used, aside from the odd hours employed in its construction.

It will be noticed that no unions are used to put the frames together. The last piece of each frame (prefera-



A Lounging Chair Made of Pipe.—Fig. 1.—A View of the Chair in Use.

bly one of the shorter pieces) has a long aud a short thread. This piece is first screwed the full length of the long thread in the fitting, and then uuscrewed, while the short thread is being screwed into the opposite fitting. The dimensions of the two frames, together with the location of the bolt holes, are shown iu Figs. 2 and 3.

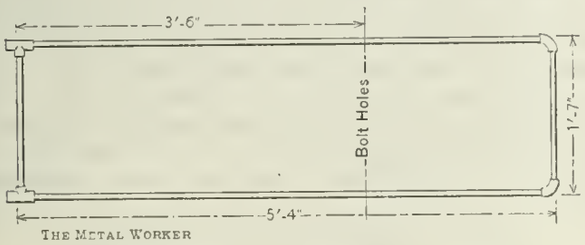


Fig. 2.—Outside Frame.

The bolts used at the point of couuection of the two frames are 2 x ¼ inch round head stove bolts. In the unused ends of the tees may be screwed ornamental pieces made of iron, lead or wood. To provide the necessary adjustment, which may vary from almost horizontal to almost vertical, a strip of ¾-inch hard wood, 3 inches wide and 3 feet long, is prepared with a row of ½-inch holes spaced 2½ inches apart down the center, as shown in Fig. 4. This strip should be

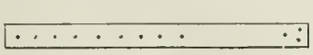


Fig. 4.—Adjusting Strip.



Fig. 5.—Metal Clip.



Fig. 6.—Adjusting Rod.

bolted to the cross bar of the front leg of the chair by means of a clip made of heavy sheet iron, as shown in Fig. 5, and 1 x ¼ inch flat head stove bolts, with heads down to prevent the bolts from scratching the floor. The flattened eye of a ⅜-inch rod, about 2 feet long, should be slipped on the cross bar of the rear leg, with a hook on the opposite end, as shown in Fig. 6, to engage the holes in the hard wood strip. A piece of strong canvas fastened to the upper cross bar of each frame completes the chair.

The iron pipe frames may be enameled or painted tastefully, and striped awning canvas can be used if desired. Instead of placing ornaments in the tees at the front of the chair, the ends of a removable foot rest to hold a cushion may be iuserted. The writer has had one of these chairs in use for ten years, and has just recently made another. While not built for two, it is amply strong for a person of ordinary weight. Owing to the inexperience of the photographer, the occupant of the chair is credited with rather more of feet than he ordinarily carries.

High Pressure Hot Water Heating.

In response to the letter of a correspondent, A. T. Hoyt presents the following in the *Florists' Exchange* on the subject of high pressure hot water heating:

I wish to state a few facts so that those who wish to do a high pressure hot water job may know some of the facts that must be taken into consideration. Water boils and makes steam at different temperatures, from 100 degrees F. in vacuo to 212 degrees sea level with open atmospheric pressure (14.7 pounds per square inch.) Increasing the pressure above one atmosphere raises the degree of heat necessary to boil water and no steam can be generated until the boiling point is reached. With the gauge showing zero the boiling point is at 212 F.; gauge showing 5 pounds the boiling point is 228 degrees F.; at 10 pounds it is 240 degrees; at 15 pounds it is 250.4 degrees; at 20 pounds it is 259.3 degrees; at 25 pounds it is 267.3 degrees; at 30 pounds it is 274.4 degrees; at 35 pounds it is 281 degrees; at 40 pounds it is 287 degrees, and at 100 pounds it is 338 degrees. It is necessary to raise the temperature of the water in the boiler to the different degrees of heat noted under the different pressures noted before the boiling point is reached or steam generated, without regard to the cause of the pressure, as the pressure is what retards or raises the boiling point degree of heat. The pressure may be from steam confined in the boiler or pipiug (as steam exerts pressure only when confined); or it may be caused by elevation of a column of water whose lower end enters the boiler so as to sustain that column, and this column may be simply 1-inch pipe, or a pipe 16 feet in diameter, or a tank of 1000 or more gallons, elevated. At 1 foot above top of boiler, or above the gauge, the pressure is 0.434, and to get the actual pressure from a column of water multiply the hight (above the gauge) in feet by 0.434, and this will give the actual pressure in pounds. A tank

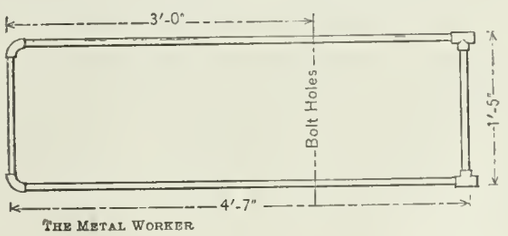


Fig. 3.—Inside Frame.

with 40 feet elevation above boiler or gauge will give 17.36 pounds actual pressure, and will retard the boiling point from 212 degrees to near 255 degrees; and, of course, a circulation can be had from this pressure that in degrees of heat will be above a tank with less elevation. The matter of closing the tank does not affect the pressure from that of the open tank until the boiling point is reached.

The only advantage in the pressure system is that the boiling point is raised, and consequently harder firing can be done, and a higher temperature gained in the circulating water; but it is a law of mechanics that something cannot be made from nothing, and the economy is in favor of no pressure above what cannot be avoided; and a system where the circulation can be carried at 212 degrees, or below it down to 100 degrees, is far cheaper than any pressure system. But the open elevated tank pressure is the safest and best pressure system, and operates just the same as the closed system until its boiling point is reached.

PLANS A HELP TO THE TRADE.

BY "BLAZES."

How often it is, in the heating business, that cases are found which compel one to believe that some of the people engaged in it are either totally blind or without reasoning faculties. "All coons look alike to me" about sums up their conception of conditions. Exposure means nothing to them; speculative buildings have no terrors for them; they go blandly on, figuring the house on a mountain top very much in the same way as to boiler power and radiation as they would the house in the middle of a sheltered city block. When the man on the mountain top complains of the lack of heat and the tremendous consumption of fuel, he is tranquilly invited to pore over the city man's job as a sample of the correctness and success of their methods and the one and only kind of work they do.

I was invited a short time since by an acquaintance who had purchased a house in a suburban district to go with him and examine the steam heating apparatus. He assured me that the idea of steam heat had been a strong factor in deciding the purchase. He wasn't sure, now, but suspected he had bought a "brick" and wished to be certain of it. Two things he had become fairly confident of, were, first, that neither he nor any of his amateur friends could ever unlock the mysteries of this apparatus, so far as heat was concerned, and, secondly, he didn't like the noise it made.

To be brief, the boiler was of a round sectional type, with 18-inch firepot, which, according to most liberal allowances for ingeniousness of construction, would be rated at 325 square feet of radiation. This, however, had no ingenuity in its construction, or rather its design, therefore 300 feet was a safer limit. Careful computation of the surfaces in radiation and exposed piping showed the total amount on the job to be 405 square feet, at least 80 feet more than the extreme limit of the boiler and fully 130 feet more than any thinking tradesman would put on it.

Another astonishing feature of this apparatus was that each of the rooms on the first floor had exactly the same amount of radiation, despite the fact that there was a world of difference as to their exposures and a great difference in their contents. Each of the three principal rooms on the second floor had also the same sized radiator, although the front room was twice the size of the adjoining one, and had a bay window facing north, also two windows facing east, while the smaller one had one window in its one eastern exposure.

The piping was small in every instance, and was run on the principle that 2-inch pipe costs more than smaller sizes; hence the 2-inch main (?) ran in a circuit (one pipe work), 7 feet being the furthest it wandered from the boiler; the connections to first floor radiators and to risers varying in their horizontal runs from eight feet to 21 feet in length. These were graded to run the condensation back to the main.

Any fitter can easily imagine what all this meant. After estimating on a proper sized boiler, new mains, and, in some cases, new risers, making necessary additions to radiators, changing valves, etc., etc., a cost was arrived at which easily exceeded the figure paid for the original work. My friend sold the house.

He has since started another house, and, in spite of my assurances that he can have a satisfactory apparatus put in, he declines to consider steam, and intends putting in hot air. Some of his other friends have jollied him on that point, but he says if that doesn't go, he can put up stoves and is having chimney openings made with that possibility in view. My friend has since told me that, through social intercourse with his neighbors, he has learned of at least a dozen jobs around him, all steam, and not two of them satisfactory, so far as the amount of heat is concerned. Half of these jobs have been put in by the same man who did the above. Steam heat, in this particular community, seems to have become a sort of joke.

I had intended bringing this article to a different ending, but in reading an editorial in *The Metal Worker* of February 1 on "Making Plans," it struck me there was room for a little argument on some of the points put forward by the fitters against the practice of making plans for their customers by the manufacturers and supply houses. The case I have described above might be considered an illustration of the desirability of making plans, etc.

I am speaking from the standpoint of a fitter, for that is my means of livelihood. I am not engaged in the manufacture of boilers, nor in selling them, other than putting them up where I can secure a contract for doing so. The question comes up to me, and very vividly, too, "How often, in estimating on steam heating work, is the figuring confined to competent men—on the spot?" For myself, I can answer that in figuring on the class of work for which these plans are made—dwelling houses in the majority of cases—I find that there are men against me whom I know to be incompetent. In eight cases out of ten, one of these men secures the contract. Why? Because of his figure. Many will say, "Oh, that sort of thing will cure itself and these fellows will drop out as soon as they see how much money they are losing and the trouble they get themselves into." Many do drop out, but others step in to take their places. The man who waits for this condition of things to cure itself will sit down and wait for any other impossible old thing.

If these people must be in the business is it not better that the supply houses or manufacturers should guide and instruct them by means of plans and specifications than allow them to go on in their wild career, wrecking their own business and giving steam and hot water heating a black eye on all sides? I would sooner a good deal figure against men who I knew had plans and specifications behind them, made by a good, responsible concern, than I would against men who year after year unload such work as in the case above cited. This man has nothing behind him but his nerve.

The average boiler salesman is usually selected for his position on account of his knowledge of the art of placing his goods, as well as for his good looks and successful selling powers. He knows that he must sell goods so that his firm may not be cumbered with afterclaps. If his business is too troublesome, he knows what he may expect, hence he tries, at least, to avoid uncertainties and endeavors to sell goods that will be capable of doing satisfactory work.

Even figuring from a set of plans and at a distance from the job, are there many supply houses or manufacturers who would be foolish enough to keep in their employ men who would lay out and specify such a piece of work as in the case above described? I fancy not. I am convinced that the practice of furnishing plans and specifications to the trade is a good one; that it tends to even up competition and gives the "competent" men a better chance for business than they would otherwise have.

Death of Philip H. Lenderking.

Philip H. Lenderking, a well-known citizen of Baltimore, died on February 21, at the Maryland General Hospital. About three weeks ago Mr. Lenderking contracted a cold, and on Wednesday of last week took to his bed. He grew rapidly worse and on Monday was removed to the hospital. The funeral was from Mr. Lenderking's home, 1803 North Payson street, on Sunday afternoon, and the interment was made in Loudon Park Cemetery.

Philip H. Lenderking was born in Hesse, Cassell, Germany, June 17, 1843, and came to this country in 1857. His parents settled in Baltimore, where the deceased learned the tinsmith trade. When the Civil War broke out Mr. Lenderking, who was only 18 years of age, enlisted in the Union Army and served until 1864, when he was honorably discharged. At the close of the war he settled in Lexington, Va., but returned to Baltimore in 1868, and the following year established himself in the business of a coppersmith, plumber and gas fitter and the sale of stoves and house furnishing goods at 203 West Pratt street. The deceased was a prominent Republican and had a strong following among the Germans. He was a member of the Maryland Legis-

lature of 1898. He was also a member of the Grand Army Club, Wilson Post No. 1 of the G. A. R.; Union Veteran Legion, Germania Maennerchor, De Kalb Lodge, Knights of Pythias, the German-American Lincoln Club and the Old Baltimore City Guard, of which there are not more than a half dozen surviving members. Mr. Lenderking leaves a widow and nine children.

SUGGESTIONS ON HOT WATER PIPING.

BY V. I. C.

Hot water is coming to be recognized as an excellent method of heating private residences; so much, in fact, that a number of plumbers are taking contracts for installing hot water plants, although they possess but the

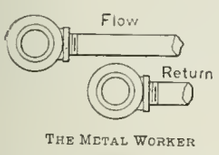


Fig. 1.—Side Feed to Branches.

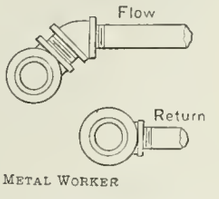


Fig. 2.—Angle Feed to Flow Branch.

Suggestions on Hot Water Piping.

first rudiments of the knowledge necessary to enable them to construct a plant that will work satisfactorily and give sufficient heat to warm a building thoroughly in zero weather.

There is no rule that will apply in all cases, giving the ratio to be used in figuring the surface necessary to properly heat a building, owing to the different range of temperature, the exposure and the various building materials used. The contractor has to rely in a great measure on his experience, or else have a competent heating engineer to figure the job for him.

There are, however, several things which a man should know himself if he intends to take heating contracts. He should know the proper pitch to give his pipes; the proper size pipes to use and the manner in which branches should be taken from the main supply pipe.

The main supply and return pipes of a hot water apparatus should have a pitch upward from the boiler of 1 inch in 10 feet.

The supply and return mains should have the same area as the total number of branches to be taken from

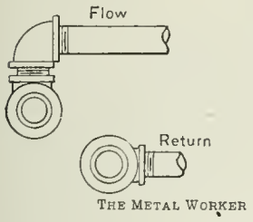


Fig. 3.—Top Feed to Flow Branch.

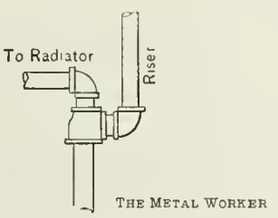


Fig. 4.—A Riser Branch.

them. For instances: There are four 1½-inch connections to be taken from the main supply pipe. The area of a 1½-inch pipe is 1.767. The area of four of these is 7.068, or the area of a 3-inch pipe. The main, therefore, where it leaves the boiler would be 3 inches, and would be reduced in size as each connection was taken off until it comes to the last, when it would be 1½ inches.

One of the main reasons why a hot water heating apparatus proves unsatisfactory is because the proper connections are not made at the branches from the main supply pipe. The sketches show how the branches to risers and radiators should be taken off the mains in different cases.

Fig. 1 shows the branch feed pipe taken from the side of the main supply pipe and the branch return pipe connected into the side of the main return pipe. This style of connection is seldom used except for connecting a riser to a single radiator on the upper floors, or to a second-story radiator in case the connection is taken from the main but a short distance from the boiler.

Fig. 2 shows the branch feed pipe taken from the main supply pipe on an angle of 45 degrees and the branch return pipe connected into the side of the main return pipe. This style of connection is used for connecting the branch to the first-floor radiator when such radiator is the first one supplied, being nearest the boiler. This connection is also used for connecting the branch to a riser that supplies two or more radiators on the upper floors.

Fig. 3 shows the branch feed pipe taken from the top of the main supply pipe and the branch return pipe connected into the side of the main return pipe. This connection is only used for connecting the branches to first-floor radiators.

It will be seen from the above that the radiators on the lower floors are to be more favored than others. Under no circumstances connect a first-floor radiator to a riser supplying radiators on the upper floors. First-floor radiators should always have a separate connection direct to the main, as the hot water has a tendency to cir-

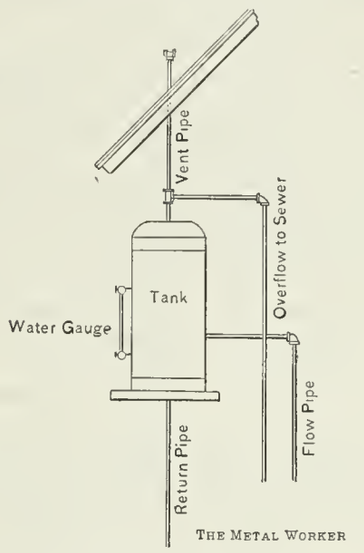


Fig. 5.—Expansion Tank Connections.

culate right past a first-floor radiator when it is fed from a riser supplying other radiators on the upper floors.

The method given in Fig. 4 is for connecting a radiator to a riser which supplies another radiator on the floor above.

It will be seen by Fig. 4 that the radiator on the lower floor has a direct connection, while the one on the upper floor is taken out of the side of the pipe supplying the second-floor radiator and runs up to the third floor.

The method of connecting an expansion tank to provide for a circulation in it to prevent freezing is shown in Fig. 5. The tank should be located above the highest radiator in the job.

Heating Trains by Steam.

Two students at the Massachusetts Institute of Technology are conducting experiments on the through trains of the Maine Central Railroad, between Bangor and Portland, to ascertain the most efficient way of heating a train in severe winter weather and of establishing a standard for the amount of steam used on different classes of trains. One of the students rides on the engine, in charge of a device for measuring all the steam that passes from the locomotive to the cars through the hose used for heating. The other student rides in the cars, with highly sensitive thermometers, from which he takes accurate readings every few minutes. Exhaustive observations are being made, and when finished the railroad officials and the instructors at the institute expect to possess much valuable data for the guidance of those who have charge of the valve controlling the steam for heating trains. It has already been discovered that a great amount of steam is wasted between the locomotive and the train. The observations are being made with different kinds of fuel, as well as with different characters of trains.

CLASSIFICATION AT THE LOUISIANA PURCHASE EXPOSITION.

The Classification Book for the Louisiana Purchase Exposition at St. Louis, in 1903, gives the following groups and classes of exhibits which will be interesting to readers of *The Metal Worker:*

Group 46 is devoted to plumbing and sanitary materials, as follows:

Class 270. Sanitary earthen ware: Bathing apparatus and attachments, lavatory fittings, laundry tubs, basins, cocks, draws, &c.; sewerage apparatus, plumbers' appliances.

Group 48 comprises apparatus and processes for heating and ventilation, as follows:

Class 283. Heating by steam, hot water, hot air and their combinations.

Class 284. Methods of conveying and distributing steam, hot water and hot air used separately or in combination.

Class 285. Natural ventilation; ventilation by exhaustion; ventilation by mechanical means and their combinations.

Class 286. Plans and models of buildings heated and ventilated; public buildings, factories, dwelling houses.

Class 287. Stoves and furnaces peculiar to the various systems of heating.

Class 288. Radiators of heat of all kinds and sizes. Steam or hot water boilers. Steam or hot water ranges. Hot air pipes. Hot air stoves.

Class 289. Ventilators and displacers of air. Up-draft ventilators.

Class 290. Methods for the direct renewal of air to warmed and ventilated apartments.

Class 291. Apparatus for household heating. Preparation and cooking of food. Stoves or chimneys, fixed or movable.

Class 292. Apparatus for heating by petroleum or gas.

Class 293. Steam cooking ranges. Kitchen ranges of all kinds, stoves used at the same time for cooking food and for warming apartments. Stoves adapted to certain special forms of cooking. Stoves and apparatus, fixed or movable, used for preparing food or beverages in large quantities.

Class 294. Ventilators operated by the wind or by difference of temperature.

Class 295. Sanitation and ventilation of kitchens and small living rooms.

Class 296. Accessories to heating and ventilation. Measuring and registering apparatus; thermometers, self registering thermometers, pyrometers, anemometers, manometers for measuring low gas pressures, and for indicating the level of water in pipes; appliances for measuring the flow of steam through pipes; registering apparatus of every kind.

Class 297. Thermostats; distributing and regulating apparatus; regulators of temperature; regulators of draft; regulators of pressure; automatic drip cocks and air cocks; cocks specially fitted for heating apparatus.

Class 298. Chimney fittings. Dampers for chimneys; closing of flues; openings for hot air and ventilation. Gratings and plates. Metallic casings for heating apparatus; special sheet iron, chimney pots.

Class 299. Fire place and chimney pottery. Stoves and chimneys in earthen ware. Ornaments. Earthen ware of every sort for the fire place. Refractory materials for hearths, hot air stoves, stoves and chimneys.

Class 300. Hearth furniture; fire lighters; ash sifters; utensils for cleaning and repairing; accessories.

The American Warming & Ventilating Company of Pittsburgh will apply for a charter on March 15. The incorporators are Henry L. Williams, Joseph E. McGinness, William W. Dobbins, Samuel Garrison and Daniel Ashworth. The company propose to make and erect warming and ventilating closet systems for buildings of every kind out of brick, stone, iron, steel and terra cotta. A complete plant is to be installed in the buildings they contract for, together with all automatic and mechanical appliances for its successful operation.

ASSOCIATION NEWS.

Minnesota Master Plumbers.

The eighth annual meeting of the Master Plumbers' Association of the State of Minnesota was held in Minneapolis last week with a large attendance and E. D. Hornbrook, president of the National Association of Master Plumbers and Vice-President Charles Polacheck as the guest of honor. Among the more important actions of the meeting were the indorsement of the Cleveland Resolutions and the reduction of the initiation fee. After electing the following officers, Winona was selected as the place for holding the next convention.

President, J. M. Jacobson, Minneapolis.
First Vice-President, W. E. Wicks, Duluth.
Second Vice-President, J. V. Cunningham, Winona.
Secretary, A. A. George, Minneapolis.
Treasurer, John MacQuillan, St. Paul.
Executive Committee: L. Neinaber, St. Paul; John L. Hague, Minneapolis, and the other officers.
Delegates to National Convention: J. M. Jacobsen, W. W. Hoopes and O. A. Blethen.
Delegates to Inter-State League: J. M. Jacobsen, J. P. Adamson and Allan Black.

The delegates were entertained with a vaudeville entertainment and a smoker by the local association.

Chattanooga Master Plumbers.

At the annual meeting of the Master Plumbers' Association of Chattanooga, Tenn., the following officers were elected for the ensuing year:

President, T. S. Wilcox.
Vice-President, J. D. Colter.
Secretary, Fred. Fox.
Treasurer, H. A. McQuade.

Master Plumbers' Mutual Protective Association.

The fourth annual meeting of the Master Plumbers' Mutual Protective Association of Baltimore, Md., was held recently, when the following officers were elected:

President, H. J. Neinhardt.
Vice-President, W. H. Schaefer.
Secretary, C. Wagner.
Financial Secretary, L. Lenderking.
Treasurer, C. Schuchard.

After the meeting a banquet, for which 40 covers were laid, was made a happy feature of the occasion, and the responses to the toasts were received with applause.

Connecticut Master Plumbers.

A meeting of the Executive Committee of the Connecticut State Association of Master Plumbers was held in Hartford on February 19, when arrangements were made for holding the annual convention in Bridgeport on May 14. Those present at the meeting were: President M. W. Manwaring of Bridgeport, First Vice-President C. E. Coe of New Haven, Second Vice-President Edward Mabl of Hartford, Treasurer James Donovan of Middletown, Secretary T. E. Logan of Bridgeport, Financial Secretary George S. Bull of Hartford, T. D. Barlow of Waterbury and F. F. Hitchcock of Woodbury.

Missouri Master Plumbers.

Eighty master plumbers from all parts of the State attended the eighth annual convention of the Missouri Master Plumbers Association, held at St. Joseph, Mo., on February 18 and 19. After discussion of the various matters brought before the convention and their satisfactory disposition, the following officers were elected:

President, S. H. Powers, St. Joseph.
First Vice-President, R. T. Connell, Kansas City.
Second Vice-President, J. J. Lawler, Springfield.
Treasurer, D. T. Atchison, St. Joseph.
Secretary, Wm. Schwer, St. Louis.
Executive Committee: J. W. Comerford, Joplin; E. D. Hornbrook, Kansas City; James P. Carroll, St. Louis; H. A. Jeffreys, Jefferson City, and the officers.

The following committees were also appointed:

Sanitary Committee: W. M. Marvin, Kansas City; W. M. Hale, St. Joseph; Thomas Armstrong, Springfield; Guy C. Coleman, Platte City; H. B. Schulte, Joplin.

Legislative Committee: John J. Foy, St. Louis; Claude L. S. Smith, Kansas City; John J. Lawler, Springfield; M. W. Jackson, St. Joseph; Jeremiah Sheehan, St. Louis.

Apprentice Committee: R. T. Connell, Kansas City; William Burke, St. Louis; F. A. Brandt, St. Louis; H. C. Tompkins, Springfield; P. L. Bristol, St. Joseph.

The delegates were given a party at the Tootle Theater by the local association.

West Hudson, N. J., Master Plumbers.

The master plumbers of Harrison and East Newark, N. J., have met and organized an association, electing the following officers:

President, Archie McArthur.
Corresponding Secretary, A. Metzger.
Financial Secretary, Arthur Danieke.
Treasurer, Robert Marshall.

THE P. AND S. S. LEAGUE.

On Monday night of last week the last regular series of the Plumbing and Steam Supply League Bowling Tournament was finished, the Ronalds & Johnson Company, Brooklyn, team winning two games, and scoring 849 in one game, the highest of the tournament. The Salesmen team was short two men and lost two games, while the C. S. Locke & Smith team broke even. On Friday, postponed and protested games brought out the teams of the Crane Company, Central Foundry Company and C. S. Locke & Smith, the Fadee & Co. team and the Ronalds & Johnson Company's, New York, team forfeiting at the conclusion. The teams of Behrer & Co., John Simmons Company and the Crane Company were tied for first place. The teams of F. N. Du Bois Company and Ronalds & Johnson Company, Brooklyn, tied for fourth place, while the Dimock & Fink Company team had the sixth place, with the teams of the Central Foundry Company, C. S. Locke & Smith and Ronalds & Johnson Company, New York, tied for seventh place.

STANDING OF THE TEAMS AT CLOSE OF TOURNAMENT.

Teams.	Won.	Lost.	Team score.	Individual score.	Name.
Crane Company	12	2	833	210	A. E. Good.
Behrer & Co	12	2	827	201	M. Behrer.
John Simmons Company	12	2	779	196	W. A. Presby.
Ronalds & Johnson Company, Brooklyn	11	3	849	198	W. T. Gilmour.
F. N. Du Bois & Co	11	3	776	212	E. E. Haff.
Dimock & Fink Company	8	6	772	194	F. G. Hogenaur.
C. S. Locke & Smith	7	7	728	193	C. A. Blanchard.
Ronalds & Johnson Company, New York	7	7	727	194	W. S. Gibbs.
Central Foundry Company	7	7	702	199	J. S. Dibley.
Salesmen	6	8	796	230	Henry Stein.
H. P. Read Lead Works	4	10	689	196	C. V. Driggs.
F. Adee & Co	2	12	695	175	A. B. Kolyer.
John A. Murray	2	12	677	189	G. W. Tilton.
E. F. Keating	2	12	675	185	C. J. McCarthy.
Thomas G. Knight	2	12	675	182	E. E. Benas.

On Thursday night of this week the teams met to settle the ties for the various prizes, with the following results, in the presence of representatives of all the other teams, and many men prominent in the trade:

THE PRIZE WINNING TEAMS.

First prize, $25, Behrer & Co.
Second prize, $20, Crane Company.
Third prize, $15, John Simmons Company.
Fourth prize, $12, Ronalds & Johnson Company, Brooklyn.
Fifth prize, $10, F. N. Du Bois Company.
Sixth prize, $7.50, Dimock & Fink Company.
Seventh prize, $5, C. S. Locke & Smith.

HIGH TEAM SCORE, $5 00.

Ronalds & Johnson Company, Brooklyn, 849.

INDIVIDUAL PRIZES.

First best average, $5, C. W. Grimshaw.
Second best average, $3, J. S. Dibley.
Third best average, $2, Rollin C. Wilson.

HIGH INDIVIDUAL SCORE, $3.00.

Henry Stein, 230.

GREATEST NUMBER OF SPARES, $5.00

E. E. Haff and A. E. Good.

The winners of the diamond cuff buttons donated by the *Plumber and Fitter* for the greatest improvement, and the gold mounted pearl opera glasses donated by W. S. Emery for the smallest percentage of breaks have not been determined.

In bowling off the ties, the team of John Simmons Company had scored 677, and were only beaten two pins by the Crane Company team, with 679, when the anchor, A. E. Good, scored 27 on a double header in the last frame. The Behrer family scored 692, and won first place. The Ronalds & Johnson Company, Brooklyn, team scored 826, and beat the F. N. Du Bois Company team for fourth place, while the C. S. Locke & Smith team scored 831, and secured the seventh prize. E. F. Ryder scored 223, and W. T. Gilmore 198 on the Ronalds & Johnson Company, Brooklyn, team, and captured the individual honors for the evening. The tournament is generally considered a very happy incident in the supply trade, and both President Haff and Secretary Wilson, who are entitled to the chief honors, are receiving congratulations.

PRESENTING THE PRIZES.

Arrangements are now being made for a dinner as a grand finale to the tournament, when some of the prominent men in the trade will present the prizes to the winners. In order that this dinner may be generally enjoyed by the trade, it is not intended to restrict it to the bowlers only. Other members of the trade can participate by arranging to procure dinner tickets, which will be sold for $1 by Secretary Rollin C. Wilson, 116 Nassau street, New York. The dinner will be served in the large dining room above the Monarch Alleys, at Twenty-sixth street and Sixth avenue, and the date will be announced when it is settled.

THE BUSINESS MEN'S CHAMPIONSHIP TOURNAMENT.

Arrangements have been completed for a competition between the different trades under the Business Men's Championship Tournament, which will be opened on March 10 at the Monarch Alleys, with a contest between teams from the Plumbing and Steam Supply League and the drug trade.

New York City Notes.

Water Commissioner Dougherty is making a strict investigation of the city water meters. He charges that many of them have been tampered with, so that they do not register properly, and that the plumbers often set them improperly so that only part of the water used goes through them. Instead of making charges against the plumbers, who are liable to lose their licenses should they tamper with meters. Mr. Dougherty might, with advantage, turn his attention to engineers and janitors, who are not above suspicion of doing such things.

* * *

John J. Tucker, a prominent builder and brother of Charles Tucker of 45 East Eleventh street, died last week.

* * *

Hugh McCormick died at his residence, 271 West 126th street, New York, on Tuesday, at the age of 76 years. He was one of the oldest members of the New York Master Plumbers' Association, and one of the charter members. He conducted a plumbing business at the above address for many years, though of late his son, James McCormick, took the active part. His funeral, which was held from St. Joseph's Church on Thursday, was attended by a number of members of the association and his friends in the trade.

Kearns Bros., Holyoke, Mass., plumbing and heating contractors, have just completed a new Pipe shop in the rear of their building, at the corner of Main and Spring streets. The building is 30 x 50 feet, and well equipped for this department of their work, their machinery cutting to 6-inch Pipe. The firm are busy with a large number of contracts, and within the last few weeks have installed about 25 new Heaters.

The Doran Light.

The Acorn Brass Works, 1523 South Jefferson street, Chicago, Ill., are sending to the trade a series of interesting pamphlets devoted to what they term the "Wonderful Doran Light." This light is said to have a brilliant illuminating power, and to embody the result of many years' experiments with hydro carbon lights. It is claimed to be softer, whiter, more diffusive and absolutely steady as compared with an electric arc light, without the glare peculiar to the arc light. A strong feature is that it is available for either buildings or street lights. The Doran lighting system is made in various capacities, from a 1-gallon lighting system to as large as may be required for lighting a group of buildings, or a number of lights on grounds. The catalogues show the different styles of lamps, some finished like a regular gas lamp, others inside a globe and the lights adapted for outdoor use, either with a large tank concealed in the base of a supporting base, or by means of a small tank or reservoir, made interchangeable, located at the top of a post. The catalogues present sectional illustrations, and give such description as makes the entire construction and operation readily understood. Some of the pamphlets are devoted to the answering of the questions that naturally would be raised by possible purchasers. They contain a variety of testimonial letters arranged to give information, and a long list of users in different parts of the country. The circulars also show the M. &. M. are portable lamps and the Acorn system light. The M. & M. light is said to have a 450 candle-power, and the Acorn system light can be regulated to furnish from 16 to 500 candle-power. In this lamp it is claimed that a gallon of gasoline will last 25 hours. With the budget of printed matter comes a little envelope showing the character of brass tubing used with the 1-gallon Doran lighting system.

Heating and Plumbing Notes.

The Royal Heating Company, 210 Mason street, San Francisco, Cal., are sending to prospective purchasers of heating apparatus in their vicinity a circular that is well calculated to attract the attention of buyers to the hot air furnace system, owing to the large and attractive illustration presented. They are also distributing a card, which is found to be the marriage certificate of a woman who desires that her husband shall enjoy life, inasmuch as she is enjoying life through the possession of a Royal Heater.

E. M. Craig, secretary of the Chicago Master Steam Fitters' Association, has been obliged to seek new quarters, owing to the destruction by fire of the Orpheon Building, in which the association offices were located. He has established an office for the present at 91 Clark street.

Louis Nado, Danielson, Conn., has the contract for plumbing two houses for George I. Eaton, in that city.

The Committee on City Property, at Providence, R. I., awarded the contract for heating the Chalkstone Avenue and the Ralph Street Schools to the Allen Fire Department Supply Company of that city.

Estimates are being made on the new building to be erected by the Eaton, Cole & Burnham Company, on Main street, Bridgeport, Conn. It will be 45 x 202 feet, three stories high, of brick, heavy mill construction, with Bullard's Plastic Cement roof. The first floor will be concreted, and an elevator will be installed. The building will be used as a machine shop.

The Standard Sanitary Mfg. Company, Pittsburgh, Pa., have declared a 7 per cent. dividend. The offices of secretary and treasurer have been combined and are filled by W. A. Myler, the former treasurer, J. W. Arrott having resigned.

The Louis Lipp Company will establish a new foundry at Fifth and Wayne streets, Cincinnati, Ohio. It will be a general jobbing foundry, operated by a corporation entirely distinct from the Louis Lipp Company, though the same interests will be largely in both. The company do their own foundry work in connection with the manufacture of Bathtubs, but when the new plant is finished this work will be done in the new plant, and the old location will be turned over to heavy castings entirely. Another cupola will be added, and the capacity largely increased. The name of the company will probably be the American Foundry Company, and it will be ready for operation about April 1.

The F. R. Dengel Mfg. Company, Milwaukee, Wis., have purchased the Plumbers' and Steam Fitters' Supply business of the Charles Winterfield Company and intend carrying a complete line of such goods.

G. G. Doyle & Co., Salt Lake City, Utah, have been awarded by the State Board of Corrections the contract for heating and plumbing the State Prison at their bid of $2349. The convicts at the prison will do the work.

A delegation of Baltimore, Md., master plumbers went to Annapolis on February 18 to urge the Governor to reappoint the present Board of Plumbing Commissioners. In the delegation were John Frainor, August Eidman, Arthur Slagle, Andrew Slagle, George W. Addison, Lloyd E. Mitchell, A. G. Alford and others. A delegation of journeymen plumbers recently went to Annapolis, also, to ask that one member of the board be appointed from among the journeymen plumbers.

J. R. Klinefelter, Baltimore, Md., has invented an apparatus for ventilating tunnels.

Contracts have been awarded for the construction of the proposed new water works for the Groton Water Company, Groton, Conn. J. J. Ryan of New London will build the dam, Taylor & Tylee of Boston will lay the pipe, the Stillwell-Bierce & Smith-Vaile Company, Dayton, Ohio, will put in the plumbing plant and gasoline engine; Tipett & Wood, Phillipsburg, N. J., will erect the standpipe, and the Warren Foundry & Machine Company of the same place will furnish the Pipe. Daboll & Crandall of New London, Conn., are the engineers.

The Hopson & Chapin Mfg. Company, New London, Conn., are furnishing the Boilers, and Newman & Cronin are doing the plumbing in three fine residences in that city.

Peck Bros., Montpelier, Vt., have the contract for installing the steam heating system in a four-story brick block that is being erected by Dr. W. B. Mayo, at Northville, in which they will use two Magee Sectional Heaters and about 2000 feet of direct radiation.

The journeymen steam fitters of Massachusetts are endeavoring to have the Legislature of that State pass a law providing for the examination and licensing of steam fitters.

T. C. Fife of Reading, Mass., has secured from the town of Weymouth a contract for the plumbing in a new brick school house there.

The Board of Health of Poughkeepsie, N. Y., have appointed Edwin L. Taylor as plumbing inspector.

A slight fire visited the plumbing establishment of Alexander Walther, 87 Westerlo street, Albany, N. Y., last week.

William R. Dougherty, 340 South Twenty-first street, Philadelphia, has secured the contract for the plumbing system in the Foulke & Long Institute, at Langhorn avenue, in that city.

As a result of the plumbing strike in Memphis, Tenn., some out of town plumbers, who were brought in to work for the master plumbers, have been assaulted. The union officials claim that they are not responsible and discountenance such actions.

The Barlow Bros. Company, Waterbury, Conn., have been given the contract for the plumbing and cornice work on the new parochial school which is being erected by the Church of the Immaculate Conception, in that city.

Plumbing Inspector E. H. Donohue of Peoria, Ill., is strictly enforcing the law requiring plumbers to take out permits for their work, in order to provide against bad plumbing in that city.

James A. Trane, 201-203 South Fifth street, La Crosse, Wis., is sending to the trade a pamphlet devoted to the Trane vacuum system of steam heating. The

catalogue shows a one-pipe system of steam piping and the method of connecting the Trane vacuum apparatus with it. The catalogue is accompanied by a report of an efficiency test.

P. A. Canfield, general manager of the Canfield Supply Company, Rondout, N. Y., and president of the National Bank of Rondout, is on an extended trip to Cuba and other Southern ports.

Henry Dunn is to open a plumbing shop at Presque Isle, Maine.

The People's Heating Company have been incorporated at Kittery, Maine, for manufacturing, leasing and renting all kinds of Heating Apparatus. The capital of the concern is $200,000 and the officers are: President, Charles C. Smith, and treasurer, W. P. Huelin.

The Lambert's Point Roofing & Plumbing Company have been incorporated at Lambert's Point, Va., with James E. Fentress as general manager; J. Alex. Jones of Norfolk, secretary and treasurer, and Jas. E. Fentress, J. Alex. Jones, J. T. Wilson, Edward Kibler and F. C. Miller, directors. The capital stock of the company will not be less than $1000 nor more than $5000, divided in shares of $100 each. The concern will do roofing and guttering of all kinds, and will deal in all kinds of material necessary to the roofing of houses and of apparatus and material for all kinds of plumbing, steam, gas and electric fittings.

The Gilmore Plumbing Company have been incorporated by U. L. Gilmore, J. H. Gilmore and D. S. Gilmore, with a capital stock of $5000, to operate in Colorado Springs, Col.

The sale of the valuable plant of the McIlwaine-Richards Company, dealers in Plumbers' and Steam Fitters' Supplies, at 114 and 116 West Maryland street, Indianapolis, Ind., is said to be under negotiation. As reported in the *Sentinel* of that city, Eastern parties have united with local capital to purchase the business. The firm have for a long time maintained a plant at Noblesville, and if the sale is completed the McIlwaine-Richards Company will concentrate their business at that point.

L. L. Bassett, New Haven, Conn., is sinking two artesian wells for the John T. Doyle Company on Franklin street, and is finishing up six wells for the Chatfield Paper Company.

The School House Commissioners of Boston, Mass., will receive bids until March 5 for plumbing the Everett School House in that city.

Constructing Quartermaster Captain G. O. Cress will receive bids until March 20, at Fort Riley, Kan., for heating and plumbing one artillery barracks and one double cavalry barracks at that place.

The 1902 catalogue of the Buffalo Meter Company, Buffalo, N. Y., describes their very complete line of Meters for measuring water, and calls special attention to their improved Niagara Meter for general house use.

The Burley Heater Company, Tyrone, Pa., general founders and manufacturers of the Burley Adjustable Heater for steam or hot water, report a heavy demand for their Steam and Hot Water Boilers. They are making shipments as far West as Wisconsin and as far South as North Carolina. They are also very busy in the foundry department, making large quantities of Gray Iron Castings for the United States Government and other parties.

Charles A. Jackson & Co., 274 Bank street, Waterbury, Conn., are making a specialty of Marble for mantels, stalls, lavatories, &c.; also Tiling and Slate for heating and plumbing work.

Quartermaster Thomas H. Slavens, 209 Thomas street, Newport, R. I., will receive bids until March 26 for heating and plumbing two sets of officers' quarters at Fort Adams.

Two high pressure Boilers in one setting and a complete power, heating and lighting plant, to cost $38,000, will be installed in the big office building of the Pittsburgh Plate Glass Company at the northeast corner of Eleventh and Arch streets, Philadelphia, Pa., by the Francis Brothers & Jellett Company, Incorporated. The work will be begun on March 1, and be completed as rapidly as possible. The same contractors will install a hot water heating system in Dr. R. W. Deaver's residence, 6105 Germantown avenue, the cost to be about $1200.

The Board of Trustees of the Central Indiana Hospital for the Insane will receive bids until March 5, at the office of A. Scherrer, Indianapolis, Ind., for the electric light fixtures for the hospital for sick patients.

The plumbers of Memphis, Tenn., have been enjoying the experience of taking an examination before an examining board of plumbers to secure certificates of competency, in order to take out a license.

James J. Walters has resigned his position with the Judson A. Goodrich Company of New York City.

The Central Supply Association, composed of the manufacturers and jobbers of Plumbers' Supplies in the Central West, held their regular quarterly meeting on Tuesday of this week at the Hollenden Hotel, Cleveland, Ohio. Some important topics were discussed at this meeting.

New Firms and Changes.

Charles E. White will open a plumbing shop and Stove store, at Wallkill, N. Y.

The Allegheny Plumbing Company have been incorporated at Allegheny, Pa., with a capital stock of $5000. The directors are Harry H. Short and Charles D. Laughlin of Allegheny, Sherman Wolfe of Bellevue and Edward A. Hess of Avalon, Pa.

Frank D. Pierce has purchased the interest of J. Weekes in the Plumbers', Steam Fitters' and Tinners' Supply house of the Hunting-Weekes Company, at Watertown, N. Y.

The Mason Heater Company of Bellaire, Ohio, have been incorporated with a capital of $100,000, to manufacture and sell Heating Apparatus.

The Charles Polacheck Company have been incorporated at Milwaukee, Wis., by Charles Polacheck, Joseph Polacheck and Arthur Polacheck, with a capital of $50,000, to deal in Plumbing and Electric Supplies.

The Sterling Automatic Instantaneous Water Heating Company of Allegheny, Pa., have been chartered with a capital of $5000. The incorporators are Dr. A. J. Boucek, Charles A. Boucek, James Tracey, William A. Bollinger and John Foerster. Dr. Boucek will be president, W. T. Sigmund, secretary, and William Z. Moller, treasurer. The company will manufacture Gas Supplies, principally a new Automatic Valve. A plant is to be erected in Allegheny. No site has yet been selected, but options on several properties have been taken. The capital of the company is soon to be increased to $20,000. The new concern expect to be ready for operation by April.

G. W. Garner & Co. have succeeded G. W. Garner in the hardware and plumbing business in Winterset, Iowa, J. H. Stone having bought a half interest in the concern.

White & Blakeslee are a new firm, composed of J. B. White and William A. Blakeslee, at Springfield, Mass., who have been formed to manufacture the Twentieth Century Water Heater for heating rooms and for heating water for domestic use, &c.

New Jersey Plumbing Specialty Company, 106 Adams street, Hoboken, N. J., have been incorporated to manufacture Plumbing Specialties, with a capital of $25,000, by Almond D. F. Adams, Austin Adams, Wm. M. F. Adams.

The blast furnace employees in the Mahoning and Shenango valleys have decided to ask for an eight-hour day, to become operative May 1. At present the men work on 12-hour shifts. Laborers who are employed ten hours will make a separate demand. It is said that some of the blast furnace operators are favorable to an eight-hour day, providing it is made universal at all the blast furnaces in the two valleys. It means, of course, a higher labor cost in the manufacture of pig iron.

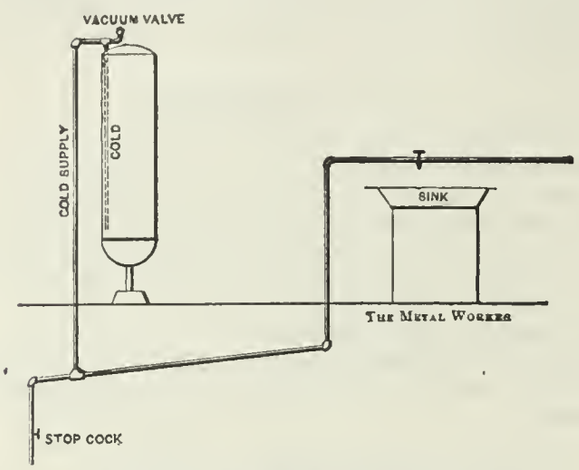
THE LETTER BOX.

Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

WHERE SHOULD VACUUM VALVE BE PLACED?

From F. E. J., York Village, Maine.—Will *The Metal Worker* tell me the proper place to connect a vacuum valve on a kitchen boiler? I have always connected them at the top of the boiler, where the supply pipe enters, as shown in the sketch herewith. I have been told by an experienced plumber that it was not the proper place, and that it should be placed on the cold water pipe over the kitchen sink, between the bibs, or in the basement just above the stop cock. He further claims



Where Should Vacuum Valve Be Placed?

that if there is no hole punched in the inner tube near the top of the boiler, he can prevent the siphonic action from emptying the boiler through the supply pipe by simply opening the hot water bib at the kitchen sink. I fail to agree with him, and would like to have *The Metal Worker* and its readers give their views on these questions.

Note.—We hope our readers will discuss this question, which we leave to them.

A HOT WATER RULE.

From L. & C., Jackson, Mich.—Will you please be so kind as to give us the most simple and practical rule to apply on hot water heating systems, in determining the amount of radiation to be used. The conditions which we wish to consider are: The temperature of the water at the boiler at 160 degrees, and the outside temperature at zero, with an inside temperature of 70 degrees in buildings where there is no solid basement under the structure, and where the outside walls are thin. We mean by this that they are not double boarded. We would also like to know the difference for figuring between upstairs and first-floor rooms. We have always had a way of our own, but would like a better way, and would thank you and the readers of *The Metal Worker* in advance for any rules that you may bring to our attention.

Note.—We hope that the request of this correspondent will not be passed over by our readers who are doing hot water heating. In the meantime we reprint the following, taken from that part of the book called "Furnace Heating" which treats of combination hot air and hot water heating:

If desired the radiating surface may be based directly on the loss of heat through walls, windows, floors and ceilings. A convenient approximate method is to consider 4 square feet of ordinary wall equivalent in heat transmitting to 1 square foot of glass; then reduce the exposure of the room to equivalent glass surface by adding to the window area one-quarter the area of the outside walls. Outside doors are to be estimated as equivalent to one-half their area in glass. If the space below or above the room is not heated add to the equivalent glass surface one-twentieth of the area of the floor or ceiling. The total equivalent glass surface thus obtained divided by 1.8 will be the amount of radiation required with the open tank system. For the pressure system divide by 2.4.

To compensate for the increased loss of heat due to winds add the following percentages:

Fifteen to 20 per cent. for rooms having a northerly or westerly exposure.

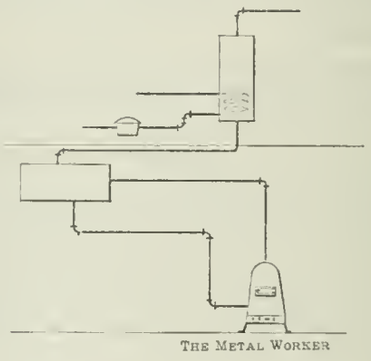
Ten to 15 per cent. for rooms having an easterly or northeasterly exposure.

For rooms with but one exposure, besides the correction for winds, add 10 to 15 per cent. to the loss of heat by transmission, to allow for the effect of the greater cubic contents as compared with the exposure than in rooms having two exposed walls. Otherwise such rooms will be slow in warming.

Owing to the character of the walls mentioned it may be better to consider 3 square feet of wall surface as equal in cooling effect to 1 square foot of glass. If the temperature in the upper rooms is not to be kept as high as in the lower living rooms, 10 per cent. less radiation may be used.

A PROBLEM IN BOILER CONNECTIONS

From B. H. C., Greenville, S. C.—We have a customer who has two 200-gallon hot water storage tanks placed as shown in the accompanying sketch. The water in the upper one is heated by means of a steam coil, and in the lower one by circulating the water through a small water heater. Our customer wants to have these two tanks connected, so that he can heat the water in both with one heating apparatus, and still have both heaters to use at will. We have advised him that this could not be done with the present arrangement of boilers and piping, because, when using the steam coil for heating the water in the upper boiler, there would be no way to make the hot water circulate into the lower boiler. Thinking that perhaps we might be in error, we shall be glad to have from *The Metal Worker* and its readers any suggestions that would apply to this case. We would also like to know the best method of connecting the two boilers to make the most hot water at one general outlet, when both boilers are in use, and the place where valves should be placed between the two boilers, when one boil-



A Problem In Boiler Connections.

er is not in use. In all our heating problems we have never had one exactly like this, and would be glad if some of the readers of *The Metal Worker* would present their solution of this one.

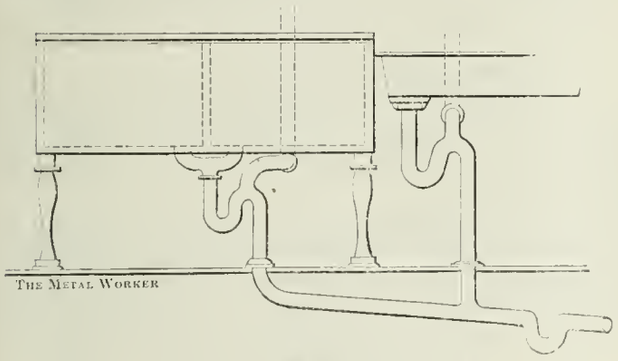
MEASURING WATER SUPPLY.

From A. E. O'T., Clinton, Mass.—The following questions were recently put to the several witnesses at a trial in court, a number of whom were mechanics representing the machinist, plumbing and tinsmith trades, besides three or four architects, and none of them were sure of their answers. The trial was for damages owing to the loss of service from springs, caused by a sewer being put through a piece of land. One man claimed that his spring would furnish water enough to fill a 1-inch pipe and keep it running. The most fall he could get from the spring was 6 feet, and the longest drive pipe from the spring he could run and keep on his own land was 25 feet. Another complainant stated that he could

have 50 feet of drive pipe with 8 feet fall, and his spring would keep a 1½-inch pipe full of water all the time. Another complainant stated that his spring would keep a 2-inch pipe full of water all the time with a fall of 10 feet and a drive pipe of 100 feet. The question was, how much water would each one of these springs furnish in 24 hours, and what was the value of the springs, provided hydraulic rams were used? The water was valued at 20 cents per 1000 gallons. In the first instance a No. 3 ram was considered, and it would have to lift the water 25 feet. In the second and third instances a No. 5 ram was considered, and it would have to lift the water respectively 50 and 80 feet. The owners of the springs had never measured their capacity before the sewer was put in, but they had old pipes of different sizes laid from the springs to tubs and formed their judgment as to the capacity of the springs by the amount of time that was required to fill these tubs. Some of the readers of *The Metal Worker* may have some simple rules for finding out the amount of water that will flow through different sized pipes at different elevations and of different lengths, also some actual experience of the amount of water different sizes of rams will furnish. I do not care for the information given in catalogues, but would like to get the practical experience of the readers of *The Metal Worker* on the questions presented.

A QUESTION IN WASH TRAY TRAPPING.

From O. F., Seaford, N. Y.—I have seen the inquiry of "M. B." in *The Metal Worker* of February 8 and agree with *The Metal Worker's* comment upon it. If I were to



A Question In Wash Tray Trapping.

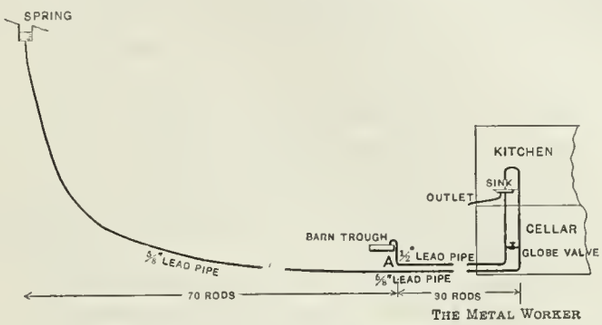
trap the fixtures as shown in Fig. 2, I would add a running trap, as shown in the sketch herewith.

Note.—We regret that our correspondent did not explain why he adds the running trap. As the fixtures are both separately protected by traps and a ventilating system, it would seem that a running trap would be entirely unnecessary.

WANTS TO AVOID WATER WASTE.

From I. Q. R., Cincinnatus, N. Y.—I desire to avoid the waste of water in the water supply system illustrated and described herewith. Three years ago I ran a ⅝-inch lead pipe from a spring to a house, and from the house, after running up to a point higher than the fixtures, I carried a smaller pipe back to a trough at the barn. This was to allow any surplus of water to run into the watering trough continuously for the use of the stock. In the cellar, a connection between the two pipes was made, so that the water could be turned on full head to the barn, in case of necessity. The present piping is unsatisfactory, from the fact that the return pipe from the house to the barn is smaller than the main supply pipe; consequently the water backs up at the house and causes trouble by overflowing in the winter and freezing in the kitchen. The spring is several feet higher than the house, and the outlet giving a good head, there is no trouble about the fall or flow of water.

What I desire to know is this: If I dig down to the pipes at the point A and cut off both pipes, connecting the ⅝-inch main pipe to ½-inch pipe, so that the supply would run from the ⅝-inch pipe through the ½-inch pipe to the house and then return through the ⅝-inch pipe to the barn, where it would connect with the short piece of ½-inch pipe which runs up from the barn trough, would I overcome the trouble? Will the force from the ⅝-inch pipe from the spring drive the water through the ½-inch pipe to the house faster than the ⅝-inch pipe from the house to the watering trough will carry it away? The object of the return pipe to the barn is to take all of the extra water to the barn automatical-



Wants To Avoid Water Waste.

ly and have no excess at the house. Of course, to change the pipes at A would necessarily cause a change in the piping and globe valve in the cellar. Any suggestion of a method by which the pipe will not have to be dug up between the house and barn and whereby all the water that is not needed at the house will be discharged at the barn will be thankfully received.

Note.—We shall be glad if our readers will give their views on this subject. In the meantime we would suggest that if the proposed changes are made the ½-inch pipe leading up from the ⅝-inch supply pipe to the barn trough should be removed and replaced with ⅝-inch pipe.

CONNECTING 45-DEGREE ELLS.

From O. S.—To settle an argument, will *The Metal Worker* inform us of the correct way to take the measurements for a pipe to connect two 45-degree ells? One party favors what is called the Philadelphia Gas Company way, which is to measure the distance of the offset on a right angle from center to center and add one-third. The Buffalo man's way is to measure in the same way and add five-twelfths of the length to the length.

Answer.—Of the two methods the last is practically correct, and is frequently used. The correct method is to multiply the length of the offset by 1.414, which gives a slightly different result that would only be of importance in case of a long offset. To reduce 1 5-12 to a decimal would give 1.416 2-3. To reduce 1 1-3 to a decimal would give 1.333 1-3, which shows which of the two methods is nearer correct. In any case, the measurements should be from center to center and allowance must be made for the fittings.

WANTS TO KEEP ROOF COOL.

From W. W., New York.—What is the best way to keep a flat roof, covered with tin, cool in the summer time, so as to reduce, so far as practicable, the heat in the top floor apartments and so as not to be injurious in the winter?

POLISHING PLATE GLASS WINDOWS.

From Reader, Missouri.—I should be glad if any of the readers of *The Metal Worker* could tell me through the Letter Box the best method for polishing plate glass windows.

HEATING A BAY WINDOW.

From W. W., New York.—When a bay window faces the prevailing winds, a large amount of cold air and cold drafts enter the house. Would it be advisable to make a branch run from the cold air box to the foot of the window at this point, particularly in windy weather?

TRADE REPORT.

MARKET SUMMARY.

Pig Tin is about ¾c. higher, with light demand.

Copper is dull and slightly lower.

Pig Lead is firm and fairly active.

Spelter has stiffened about ⅛c., but is quiet.

Antimony is unchanged.

Nickel is in good demand at former prices.

Aluminum is active and without change.

Tin Plates are firm and moderately active.

Sheets are very strong and demand urgent, on prospect of scarcity.

Sheet Copper is in good demand, and firm in price.

Scrap Iron is higher in price, and in large demand.

Old Brass and Copper are moving freely, and are firm in price.

Foundry Iron is very strong, with high premiums for early deliveries.

Hardware is moving actively, and prices, as a whole, show strength and steadiness.

House Furnishing Goods are in excellent demand, and prices firm in all directions.

Plumbers' Earthen Ware has been advanced 5 per cent.

Cast Iron Soil Pipe and Fittings have been marked up 10 per cent. in price.

Wrought Iron Pipe is likely to advance.

Lead Traps are 10 per cent. higher.

Solder rules about ½c. higher.

Wire Nails are unchanged.

Cut Nails are firm and in moderate demand.

Window Glass is still unsettled.

White Lead is firm and in fair demand.

Linseed Oil is firm and quiet.

Spirits Turpentine rules steady and quiet.

Old Rubber is quiet, except Rubber Shoes, which have advanced ¼c.

Manila Rope was advanced ½c. a lb.

METAL MARKET.

NEW YORK, February 28, 1902.

Pig Tin.—Current business in Tin is still very small. Consumers seem to be well supplied, and only small orders are coming forward. Since our last report prices here have advanced, notwithstanding a downward reaction in the London market. That market, however, was reported firm and higher at the close. Jobbers' quotations for small lots of Straits Pig are about ¾c. above those quoted in our last report. The present price is about 26½c. to 27c. per lb. It is said that spot Tin in London is in the hands of one party. These interests are said to have formed a syndicate with another clique, who are buying futures, and between them they have inaugurated a movement for a rise, with the hope that America will be forced in to help them out. It is not believed here, however, that any such necessity will arise, as large consumers are well supplied, having bought shipments at low prices. Receipts for the month to date have amounted to 2265 tons.

Copper.—The Copper market is still very quiet, with prices unchanged, although some weakness appeared late in the week in sympathy with a downward movement in the London market. Lake ingot in small lots rules at about 13¼c. to 13½c. per lb., and Casting Copper at about 13¼c. Exports are going on at a great rate, and have amounted thus far this month to about 12,000 tons. This movement is expected to continue for some time, as the price of Copper in London has held at a relatively high figure.

Sheet Copper.—The demand for Sheet Copper keeps up in good volume and comes from all classes of consumers. Prices rule firm on the basis of 18c. per lb. from store.

Pig Lead.—There is nothing of interest in this market, with the exception of the fact that it is now impossible to obtain Soft Missouri for spot or nearby delivery. Prices are firm, and the demand is referred to as fairly large. Jobbers quote American Pig in small lots at 4.45c. to 4½c. per lb. St. Louis advices report that a considerably better feeling exists in the Pig Lead market in that quarter. Transactions have been on a much broader and heavier scale since our last report.

Spelter.—Owing to the operations of the speculative element in the West the price of Spelter here has advanced during the week. Retail prices are about ⅛c. higher, good Western brands in small lots being quoted at 4.60c. to 4.70c. per lb. The trade, however, is quiet, transactions being on a very moderate scale. St. Louis advices are to the effect that a much better demand for Spelter has shown itself in that market, and, owing to the limited stock at the smelters, the price has improved materially.

Sheet Zinc.—The demand for Sheet Zinc is about of average volume. Jobbers quote 600-lb. cask lots at 6¾c., and smaller quantites at 7¼c. per lb.

Antimony.—This metal is unchanged. Hallett's is quoted at 8⅜c. to 8¾c. per lb. in small lots; U. S. at 8⅜c. to 8½c., and Cookson's at 10¼c. to 10¾c. per lb.

Nickel.—The market is unchanged, small lots being quoted at about 55c. to 60c. per lb.

Aluminum.—There is a good demand for Aluminum in all its forms, and prices remain at the level they have held for some time past. Small lots of No. 1 Ingot guaranteed 99 per cent. pure are quoted at 37c. per lb., and 100-lb. lots at 35c.

Tin Plates.—Nothing new has developed in the Tin Plate situation. Shipments are being made in large volume from the mills, but almost all of these are in the nature of deliveries on old contracts. New business is said to be of moderate proportions. The canners, some of whom were badly caught last year by the failure of crops, seem to be nervous this season about contracting for much stock ahead, although this is the time of the year in which they have been accustomed to place their contracts for their season's supplies. It is said that a number of the canners have not yet placed their contracts for Plates. Considering the fact that the mills are all behind in their deliveries, particularly on Coke Plates, it would seem that some of these consumers may find themselves in an uncomfortable position later on, should the crops promise to be of even average size, for they will then all be coming into the market with a rush, and will find that the mills are unable to supply them with spot deliveries at any price. The retail demand for Tin Plates in this section is of fair volume for the season, and prices, as a whole, are well maintained, although some instances of cutting are mentioned. Stocks in jobbers' hands are by no means heavy; in fact, there is still a decided scarcity of some sizes and gauges of Plates. American Bessemer Coke Plates, IC, 14 x 20, in small lots, delivered at New York and corresponding points, are selling at $4.85 to $5 per box. The Welsh Tin Plate market appears to be very strong. Another advance of three pence per box took place this week, making the base quotation 13 shillings 9 pence per box, f.o.b. Swansea.

Sheets.—The demand for Sheets is still very urgent and the mills have all they can do to meet it. Prospects appear to indicate a considerable shortage during the next few months, as the makers have great difficulty in getting Sheet Bars, the scarcity of which seems likely to continue. In view of this fact the mills do not seem anxious for large orders at the present time. It is said that the independent Sheet mills have made arrangements to import Steel from Europe, and have sent a

commissioner over for that purpose. A number of these new concerns are said to have already defaulted upon contracts received by them when they started into operation a few weeks back. The trade is looking for quite a marked scarcity in Sheets along about April or May, when the demand is usually very heavy. Some large orders for Galvanized Sheets have recently been placed, and the market on these goods, as well as on Black Sheets, is very firm. No. 27 One Pass Cold Rolled Soft Steel Sheets are quoted in New York at 3.9c. to 4c., and Galvanized Sheets at 67½ and 5 per cent. to 70 per cent. off the list.

Chicago advices are as follows: An excellent demand is noted for both Black and Galvanized Sheets, and difficulty is now encountered in endeavoring to find a mill which is not sold considerably ahead. Jobbers quote small lots at 3.35c. to 3.45c. for No. 27 Black and 70 and 5 to 70 and 7½ on Galvanized. It is expected that jobbers' prices will soon be advanced, as they are unremunerative.

Old Metals.—Demand for Scrap Iron exceeds the supply. Prices are higher and very strong. Old Brass and Copper are in good demand also. Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper	per lb. 10¾c.
Light and Tinned Copper	per lb. 9 c.
Heavy Brass	per lb. 8¾c.
Light Brass	per lb. 6¼c.
Lead	per lb. 3⅝c.
Tea Lead	per lb. 3½c.
Zinc	per lb. 3 c.
Pure Aluminum, Sheet	per lb. 25c.
Cast aluminum	per lb. 20c.
No. 1 Pewter	per lb. 15¾c.
No. 2 Pewter	per lb. 8 c.
Tin Plate Scrap, per gross ton	.... to $5.00
Wrought Iron Scrap, per gross ton	$13.50 to 14.00
Heavy Cast Scrap, per gross ton	12.50 to 13.00
Stove Plate Scrap, per gross ton	9.50 to 10.00
Burnt Iron, per gross ton	7.00 to 7.50

THE PIG IRON MARKET.

New York.—The Iron market has quieted down somewhat, an increasing number of foundries having covered for the second half. There is some inquiry for nearby delivery, some of the furnaces having evidently oversold themselves. We quote for Northern Irons: No. 1, $18 to $18.50; No. 2 X, $17 to $17.75; No. 2 Plain, $16.75 to $17; Tennessee and Alabama brands, No. 1 Foundry, $16.50 to $17; No. 2 Foundry, $16 to $16.75; No. 1 Soft, $16.50 to $17; No. 2 Soft, $16 to $16.50; No. 3 Foundry, $15.50 to $15.75; No. 4 Foundry, $15 to $15.50.

Chicago.—Another week of heavy tonnage has been experienced. Certain large consumers are purchasing all the spot Iron they can secure, taking almost any quality. This is caused by the inability of some of the furnacemen to fill contracts, owing to the banking of furnaces for lack of Coke. The high prices now ruling are having some effect in chilling the ardor of prospective buyers, but there are enough others who must have Iron to make the new rates effective. Large producers of Pig Iron are endeavoring to allay the apprehension of buyers relative to the supply during the last half of the year. It is claimed that a considerable furnace capacity can then be diverted from Bessemer to Foundry Iron, which will enable the market to be supplied. We quote as follows:

Lake Superior Charcoal	$20.50 to $21.50
Local Coke Foundry, No. 1	17.50 to 18.00
Local Coke Foundry, No. 2	17.00 to 17.50
Local Coke Foundry, No. 3	16.50 to 17.00
Local Scotch, No. 1	17.50 to 18.00
Ohio Strong Softeners, No. 1	19.50 to 20.00
Southern Silvery, according to Silicon.	16.90 to 17.15
Southern Coke, No. 1	16.40 to 16.65
Southern Coke, No. 2	15.65 to 15.90
Southern Coke, No. 3	15.15 to 15.40
Southern Coke, No. 1 Soft	16.40 to 16.65
Southern Coke, No. 2 Soft	15.65 to 15.90

Philadelphia.—It is hardly possible that a large volume of business has been done, simply because there was so little Iron to sell. Quotations are practically of no use at all, because, in most cases, when a price is named it is immediately followed by the remark, "But we have no Iron to offer." In other cases the question and answer is about as follows: "Yes, we will sell you some Iron at $16.50 for No. 2 X Foundry, but we cannot guarantee deliveries." It would seem, therefore, that quotations such as these are meaningless, but when a buyer says he must have Iron, and have it quick, it becomes quite another matter, and prices with guarantee of shipment covering, say, 60 to 90 days, are from $18 to $18.50; that is to say, $1.50 to $2 beyond quotations, which are practically without any guarantees at all. Sales, therefore, are gradually narrowing down to a point which means prompt deliveries. The extreme range of quotations may be given as folows for Philadelphia and nearby deliveries, subject to conditions as above mentioned:

	Deliveries to July.	Deliveries July to December.
No. 1 X Foundry	$19.00 to $19.50	$18.00 to $18.50
No. 2 X Foundry	17.75 to 18.50	16.50 to 17.00
No. 2 Plain	17.00 to 17.50	16.00 to 16.50

Pittsburgh.—The Coke situation does not show much betterment, and blast furnaces are still hampered a good deal in operations on this account. The chief trouble seems to be lack of motive power and yards, and it will probably be a long time before there is permanent improvement. Buyers of Pig Iron seem to be scared as to supply, and are offering high prices for Iron for the second quarter and through the last half. Consumers of Foundry Iron are buying heavily through the second half and for the third quarter and Standard No. 2 Foundry has sold as high as $17.25, at furnace.

Cincinnati.—There has been quite a large volume of business in the Pig Iron market last week. The great bulk of tonnage was for delivery during the last half of the year. There has been and still is a strenuous effort on the part of some sellers to put prices above the present level, but so far as deliveries from July on are concerned their efforts have not been altogether successful. For delivery up to July there can hardly be said to be a regular quotation, and prices on what little there is to be had range up to $1 per ton higher than the minimum figures given herewith. The situation is generally a pleasant one, and the market is undoubtedly as strong as it has been. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$15.25 to $15.75
Southern Coke, No. 2	14.75 to 15.25
Southern Coke, No. 3	14.25 to 14.75
Southern Coke, No. 4	13.75 to 14.25
Southern Coke, No. 1 Soft	15.25 to 15.75
Southern Coke, No. 2 Soft	14.75 to 15.25
Southern Coke, Gray Forge	13.75 to 14.25
Southern Coke, Mottled	13.75 to 14.25
Ohio Silvery, No. 1	17.75 to 18.25
Ohio Silvery, No. 2	17.25 to 17.75
Lake Superior Coke, No. 1	18.10 to 18.35
Lake Superior Coke, No. 2	17.60 to 17.85
Lake Superior Coke, No. 3	16.35 to 16.85

St. Louis.—A very large volume of sales, including some heavy individual requirements, can be recorded the past week in the Pig Iron market. The bulk of the business was for the last half of the year. As we have pointed out before, it looks as if the larger buyers at this center were pretty well covered for the present. Premiums as high as $1 per ton are being offered for material for immediate delivery, but these offers are generally for small lots and in the majority of cases have been met. The demand included Iron of all grades. Prices are very firm and we quote for cash, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry	$15.75 to $16.00
Southern, No. 2 Foundry	15.25 to 15.50
Southern, No. 3 Foundry	14.75 to 15.00
Southern, No. 4 Foundry	14.25 to 14.50

CHICAGO REPORT.

Scrap Iron and Steel.—All kinds of Scrap are in active demand and prices are strong. We quote dealers' buying prices for carload lots, Chicago delivery, as follows:

	Per net ton.
Country Wrought Scrap	$14.00 to $14.50
Machinery Cast	13.00 to 13.50
Malleable Cast	12.00 to 12.50
Stove Plate (free from burnt)	10.00 to 10.50
Burnt Iron and Grate Bars	7.00 to 8.00
Sheet Iron and Hoops	8.00 to 8.50
Plow Steel	11.00 to 11.50
Breaking Stock	.... to 11.00
No. 2, such as Shovels, Hoes, &c	7.00 to 7.50
Old Boilers—whole (Iron)	9.00 to 9.50
Old Boilers (Iron) cut in single Sheets and Rings	12.00 to 12.50
Old Gas Pipes and Boiler Tubes	12.00 to 12.50
Cast Borings	6.50 to 7.00
Turnings	11.50 to 12.00
Horseshoes	14.00 to 14.50

Old Metals.—Consumers would buy freely, but find stocks small. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	11 c.
Copper Bottoms	9⅛c.
Copper Clips	10 c.
Red Brass	10½c.
Yellow Brass	8 c.
Red Brass Borings	9 c.
Yellow Brass Borings	7¼c.
Light Brass	6 c.
Pipe Lead	3.50c.
Tea Lead	3.25c.
Zinc	2.90c.
Tin Foil	18 c.
Pewter, No. 1	16 c.
Pewter, No. 2	14 c.
Aluminum	20 c.

Old Rubber.—A sudden demand has sprung up for Rubber Shoes, which has stiffened prices, but they are not expected to hold, as general trade is quiet. Dealers' buying prices are as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	42.50	.....
Rubber Shoes	....	6.75 to 7c.
Rubber Car Springs	....	5½c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6½c.
Black Rubber	....	4 c.
White Rubber	....	8 c.

Rags.—Dealers quote buying prices of good Country Mixed Rags, Chicago delivery, at 75c. to 85c. per 100 lbs. in any quantity.

Anthracite Coal.—Business is fair but not so active, owing to more moderate weather. Prices are unchanged, as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis	5.75	6.00
St. Louis	6.20	6.45
Kansas City, Mo	8.25	8.50

THE HARDWARE TRADE.

The severe weather which has prevailed so widely through the country during the past week or ten days has put, for the time being, something of a damper on the trade, but notwithstanding these influences the volume of current business has been large. The salesmen of the jobbers visiting the smaller houses report generally an excellent feeling and are sending in well assorted orders. Merchants generally are buying with a good deal of freedom, anticipating a good business during the spring and summer. There is little apprehension of an early weakening in the market, but at the same time the anticipation of higher prices is having little influence in enlarging orders. Manufacturers are also busy soliciting orders, except the comparatively small number whose production is disposed of for the season. Prices generally are steady and firm. The strength of the Iron market is being felt along almost the entire line of manufactured products. The business of the country moves along in excellent volume and manufacturers and merchants are for the most part making money. The trade of the country with foreign markets is also in very satisfactory shape, and whatever influences may for a time operate to shut off business which has been coming to our mills and factories, the general trend of things is toward a steadily increasing foreign trade.

NOTES ON PRICES.

Cast Iron Soil Pipe and Fittings.—At a meeting of the manufacturers of Cast Iron Soil Pipe and Fittings, which was held in Milwaukee, Wis., on February 26, prices were advanced 10 per cent. This advance had been deferred from the last meeting, which was held in New York City in November. At that time an advance of 5 per cent. was contemplated, but owing to the continued increase in the cost of pig iron an advance of 10 per cent. was decided upon by the association. Conditions of sale and regulations regarding shipments and territory are unchanged. The association also adopted prices which are to be charged to plumbers, contractors and other parties in the trade who are not jobbers. These prices are as follows:

2 to 6 inch Standard Pipe, 50 and 10 per cent.
2 to 6 inch Extra Heavy Pipe, 65 per cent.
2 to 6 inch Standard and Extra Heavy Fittings, 70 per cent.
Larger sizes of Pipe and Fittings, 50 per cent.

There will be a freight allowance on all carload shipments. Less than carload shipments are to be f.o.b. foundry. All the members of the association have reported their sales, together with a list of their unfilled orders. All orders are now taken for shipment within 30 days, and specifications accompany every order. This prevents the placing of blanket orders and protecting or covering jobbers for excessive amounts of goods, which heretofore were liable to cancellation if orders did not materialize.

Sanitary Earthen Ware.—The Sanitary Potters' Association, in addition to perfecting their organization, have adopted new prices which show an advance of 5 per cent. to the jobbing trade. They have also effected an arrangement among the members whereby it will be impossible for any member of the association to break prices. This arrangement has been brought about through the co-operation of the different associations of jobbers throughout the country. The new prices and discounts will be enforced upon all staple Sanitary Earthen Ware on and after March 1. The discount to plumbers will be 50 per cent. from the standard American list, which has been in effect since July 17, 1899, among the members of the Sanitary Potters' Association. The sales of all the members are to be confined exclusively to jobbers. Seat Attachments, Spuds and Metal Connections are to carry the same discount as the Earthen Ware. Packages are to be charged net extra as per list. The association, in confining their sales to the jobbers exclusively, have extracted from the jobbers a promise that all of their purchases of Sanitary Ware must be confined to the wares produced by the members of the Sanitary Potters' Association. If any of the members of the Sanitary Potters' Association sell goods to the jobbing trade at any price or on any terms different from those established by the association the jobber, according to his agreement with the potters, is compelled to give the association a written notice of this fact. This he is to do without specifying names or details. This is required of the jobber in order that every member of the association may have an opportunity to sell as low and upon as good terms as any other one, thus assuring all customers that they will be able to buy as cheaply and upon as good terms as any other jobber. The jobbers also agree not to sell any ware to jobbers who do not take their requirements in Earthen Ware from the members of the Sanitary Potters' Association. The parties composing the membership of the Sanitary Potters' Association are as follows: Trenton Potteries Company, Thomas Maddock & Sons Company, John Maddock & Sons Company, Keystone Pottery Company, Bellmark Pottery Company, Egyptian Pottery Company, Mercer Pottery Company, Brian Pottery Company, Acme Pottery Company, Ironsides Pottery Company, Riverside Pottery Company, Great Western Pottery Company, Willets Mfg. Company, Sanitary Earthen Ware Specialty Company and Standard Sanitary Mfg. Company.

Wrought Iron Pipe.—The National Tube Company, with the aid of the parent company, the United States Steel Company, have the Wrought Iron Pipe situation entirely in their own hands, and the United States Steel Company have put the price of Skelp, from which all Wrought Iron and Steel Tubing is made, at such a price that the independent Tube companies, who are in a great measure dependent upon them for their raw material, are compelled to make prices which are similar to, if not higher than, those of the National Tube Company. It is reported that Wrought Iron Pipe is to advance on March 1. This is pretty well understood in the trade, as the agents of the Tube Company have been working for the past two weeks cleaning up all the business that remained unbroken, so that when new prices are announced all the friends of the National Tube Company would be fully protected for their wants. Persons who are in a position to know predict a great scarcity of Wrought Iron Pipe and Tubing during the summer months. They claim that the production is entirely inadequate to the present demands. It is said that by July 1 fully 75 per cent. of the producing capacity in Tubes will be controlled by independent concerns, but

even though the independents have this advantage over the National Tube Company, they will still be at a disadvantage, inasmuch as they will be compelled to go to the United States Steel Company for their raw material. While this continues the National Tube Company will have entire control of prices in the Pipe market.

Solder.—Following the stiffening in the price of Pig Tin, manufacturers of Solders have advanced their quotations. Half and Half, guaranteed, in small lots. is now quoted by jobbers at 17 to 17½ cents per pound, and No. 1 at 14½ to 16 cents.

Window Glass.—No new developments of importance have occurred in the Glass market during the week. Large buyers are not placing orders for Window Glass, owing to the unsatisfactory condition of the market. The Jobbers' Association are quoting a discount of 90 and 10 per cent. from store.

Cordage.—The manufacturers of Manila Rope have again advanced that commodity ½ cent, and Sisal Rope 1 cent a pound.

White Lead.—Transportation in this section of the country has been so seriously interfered with that very little spot business in White Lead in Oil has been done. Orders for future shipment are being received in fairly good volume, with prospects of a good spring trade. Lots of less than 500 pounds are quoted at 6½ cents per pound and smaller quantities at 6¾ cents.

Linseed Oil.—The market is firm and quiet at previous quotations. Buying is confined to the immediate requirements of the trade, while large consumers appear to have their present needs supplied. Crushers are strong in their views and are not offering inducements in the matter of price to secure orders. City Raw is quoted at 64 cents per gallon.

Spirits Turpentine.—The Turpentine market is quiet at unchanged quotations. Inclement weather and recent holidays have probably had an effect on the demand. Retail quotations are 45½ to 46 cents per gallon.

Old Rubber.—The demand for Old Rubber is rather tame. Dealers in New York and vicinity are paying about the following figures:

Car Springs, ton lots, per lb	5½c.
Rubber Shoes, less than carloads, per lb	6¾c.
White Wringer Rolls, per lb	6¾c.
Inside Bicycle Tubing, per lb	21½c.
Outside Tubing, per lb	6½c.

TRADE NOTES.

The J. D. Smith Foundry Supply Company, Cleveland, Ohio, are sending out an attractive little pamphlet, entitled "A Few Points About Plumbago and Silver Lead." The work is gotten up in artistic style, and is profusely illustrated with views of portions of the globe in which Plumbago is found, together with pictures of the natives of those regions. The letterpress contains much useful information regarding Plumbago and its application to foundry purposes. The last pages of the pamphlet contain a list of the various Foundry Materials manufactured and sold by the company.

Lionel M. Stern of the National Paint & Varnish Company, Cleveland, Ohio, has favored us with a copy of his treatise on "The Preservation of Metals," which is described as a practical, comprehensive handbook for architects, builders, mechanical and civil engineers, painters, metal workers, property owners and any one supervising the maintenance of steel and iron structures. The publication is a pamphlet of 22 pages, inclosed in a paper cover. It gives exhaustive directions for the application of paints and other preservative materials on metal surfaces, the protection of those surfaces before the reception of the paint, and information as to colors of paints and the oils to be used with them. A section is also devoted to the consideration of rust and other destructive agents.

The factory of the Hampden Corundum Wheel Company, Springfield, Mass., was almost totally destroyed by fire last week, causing a loss of about $50,000.

It is said the opening of navigation in the early spring will find the railroads facing the worst car famine in their history. With but little ore moving now and coal traffic also light, the railroads are unable to supply enough cars to carry coke to the furnaces, and with the opening of navigation, when ore and coal movement will be heavier, the situation is likely to be much worse, instead of better.

The Sportsmen's Show.

The out of town dealer who visits New York from March 5 to 19 will combine business with pleasure by visiting the eighth annual exhibit of the Sportsmen's Association, which opens in Madison Square Garden next Wednesday. Many a useful hint on displaying sporting goods can be gained, as well as the best information about them and their sale. Among the things that will be of special interest will be camp stoves and cooking equipment, ammunition, fishing tackle, knives and guns, which are handled by many house furnishing goods dealers. Then, as a matter of diversion and entertainment, the show will have many attractions, in addition to the display of goods, which should prove of equal interest, even if not from the point of profit, for the latest in boat motors, bicycles, automobiles and similar devices not yet in such general use as to be familiar with all will be on exhibition.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED FEBRUARY 28, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots ₩ D, 37¢
100-D lots ₩ D, 35¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 Ds or more.

	6-in.	14-in.	24-in.
Wider than		14-in	24-in.
And including	14-in	24-in.	80-in.
	₩ D	₩ D.	₩ D.
Nos. 13 to 19	$0.42	$0.44	$0.47
" 20	.44	.40	.49
" 21 to 23	.46	.48	.51
" 24	.46	.50	.53
" 25	.47	.51	.54
" 26	.47	.54	.59
" 27	.48	.57	.62
" 28	.48	.57	.64
" 29	.49	.60	.69
" 30	.50	.64	.77

Note.—Lots of less than 50 Ds 5¢ ₩ D extra.

Antimony—

Cookson ₩ D, 10¼@10¾¢
Hallett's ₩ D, 8¾@8¾¢
U.S. ₩ D 8¾@8¾¢

Brass, Roll and Sheet 30%

Conductors—
Corrugated.

Round or Square.—

Galvanized ⅛ or more, N'st'd 70&5%
" Not Nested 70&2½%
" Plain Round, ⅛ or more, Nested 70&5%
Galvanized, Plain Round, Not Nested. 70&2½%

Spiral Riveted.

Galvanized 40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—

See *Strainers, Conductor*

Copper—

Lake Ingot 13¾@14 ¢
Castiug 13¼@13¾¢
Sheet and Bolt 18¢ ₩ D basis
Cold Rolled Sheets 19¢ ₩ D basis
Cold Rolled and Polished Sheets 20¢ basis
Planished Sheets 21¢ basis
Bottoms, Pits and Flats ₩ D 22¢ basis

Eave Trough Galvanized

Territory.	L. C. L.
Eastern	75&10%
Central	75&7½%
Southern	70&12½%
S. Western	70&10%

Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint list, 25%

Elbows—Plain Adjustable—

Eastern List.

Tin 30%
Galvanized 30%
Perfect Elbows 40%

Stove Pipe—

Four-Piece

	4	4½	5	5½	6-inch.
No. 1	$0.80	.85	.90	1.00	1.05 per doz.
No. 2	.05	.70	.75	.80	.85 "
No 3	.60	.63	.65	.70	.80 "

Elbows and Shoes—

Galvanized 60%

Gasoline—

See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, C. R., Soft Steel.	R. G. Cleaoed.
Nos. 14 to 16	₩ D. 3.60	3.85¢
Nos. 18 to 21	₩ D. 3.70	3.75¢
Nos. 22 to 24	₩ D. 3.80	3.85¢
Nos. 25 and 26	₩ D, 3.90	3.95¢
No. 27	₩ D, 4.00	4.05¢
No. 28	₩ D, 4.10	4.15¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₩ D 11@14 ¢
Do. Stained 6@10½¢
Patent Planished. ₩ D A, 12¢; B, 11¢ net

Galvanized.

Nos. 10 to 16	₩ D, 12¢	67½&5&10%
Nos. 17 to 21	₩ D, 13¢	
Nos. 22 to 24	₩ D, 14¢	
Nos. 25 to 26	₩ D, 15¢	
No. 27	₩ D, 16¢	
No. 28	₩ D, 17¢	
No. 29	₩ D, 19¢	
No. 30	₩ D, 21¢	

36 in. 1¢ ₩ D higher.

Lead—

American Pig 4.45@4½¢
Bar 5@5½¢
Pipe 6½¢ 20% off
Tin Lined Pipe 12½¢ 20% off
Block Tin Pipe 35 ¢ 20% off
Sheet Lead 7½¢ 20% off
Old Lead in exchange, 3½¢ ₩ D.

Mitres, Eave Trough—

See *Eave Trough Mitres.*

Nickel—

Per D 53@60¢

Paints, Oils, &c.—

Leads—

Lead, American White, in Oil:
Lots of 500 D or over 6¼ @ 6½
Lots less than 500 D 6½ @ 6¾
Lead, White, in oil, 25 D tin pails, add to keg price @ ¼
Lead, White, in oil, 12½ D tin pails, add to keg price @ 1
Lead, White, Dry in bbls 5¾ @ 6
Lead, White, in bbls., ½ bbls. and assorted tins, add to keg price @ 1¼
Lead, Red, bbls., ½ bbls. and kegs:
Lots 500 D or over @ 6
Lots less than 500 D @ 6½

Oils—

Linseed, City, raw ₩ gal. 64¢
Linseed, City, boiled 66¢
Linseed State and West'n, raw 63¢

Spirits Turpentine—

In Southern bbls 45½@46 ¢
In machine bbls 46½@47 ¢

Putty—

In bulk $1.25
In bladders 2.25
In cans 12 D to 25 D 2.25
In cans 1 D to 5 D 3.25

Petroleum Products—

In Barrels (Barrel Included)

Stove Gasoline ₩ gal. 10½@11¢
Kerosene ₩ gal. 12@13¢

Pipe, Drain 40%

Pipe, Spiral—

See *Conductors.*

Registers—

List Sept. 2, 1901.

Black Japanned 60&10@60&10&5%
White Japanned 60&10@60&10&5%
Nickel Plated 60&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze 60&10@60&10&5%
Electroplated in Brass, Bronze or Copper 60&10@60&10&5%
White Porcelain 60%
Solid Brass and Bronze Metal 50%

Roofing Material—

1 Ply Tarred Paper. ₩ ton. $30.00@31.00
2 Ply Tarred Paper ₩ roll, 108 sq. ft. 50@55¢
3 Ply Tarred Paper ₩ roll, 108 sq. ft. 70@75¢
Slater's Felt roll 500 sq. ft., 50@60¢
Roofing Pitch ₩ bbl. $3.35

Rosin—

Common and Good—Strained.

Rosin, C. & D ₩ bbl. $1.55 @$1.60
Rosin, E. & F ₩ bbl. 1.60 @ 1.65
Rosin, G. & H ₩ bbl. 1.70 @ 1.75
Rosin, I. & K ₩ bbl. 1.95 @ 2.60
Rosin, M. & N ₩ bbl. 3.00 @ 3.60

Shoes and Elbows—

See *Elbows and Shoes.*

Slate Roofing—

f. o. b. cars, Quarry Station.

	According to size.
Pennsylvania:	
Best Bangor, ₩ sqr	$3.25@$4.50
No. 1 Bangor Ribbon, ₩ sq	3.00@ 3.50
Pen Argyle, ₩ sqr	3.00@ 3.75
Peach Bottom, ₩ sqr	4.85@ 5.00
No. 1 Boys, ₩ sqr	3.35@ 3.55
No 1 Chapman Keystone, ₩ sqr	3.25@ 4.25
Vermont:	
Sea Green, ₩ sqr	$2.00@$3.25
Purple, ₩ sqr	3.75@ 4.25
Unfading Green, ₩ sqr	3.25@ 4.50
Red, ₩ sqr	7.00@11.00
Maine:	
Brownville, Unfading Black:	
No. 1 quality	$5.25@7.50
No. 2 quality	$4.25@6.00

Solder—

½&½ guaranteed 17@17½¢
No. 1 14½@16¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	Per Pound. Smaller Barrels	Q'ntities
Concentrated Flux	4c	5c
Eureka Flux:		
Triple Strength	3c	3½c
Extra Concentrated	4½c	5c
Crystal		7c
Gedney's Fluid	2c	2c
Lennox Fluid	2c	3c
Perfection Flux	3c	3½@4c
Yager's Salts, 1 lb. bottles		each, 50¢
5 lb. bottles, per lb., 45¢		

Soldering Coppers—

Per D 20@22¢

Spelter—

Western Spelter 4.50@4.70¢

Spiral Pipe—

See *Conductors.*

Stove Pipe Elbows—

See *Elbows, Stove Pipe.*

Stove Trucks—

See *Trucks, Stove.*

Strainers, Conductor—

Galvanized 50%

Tin Pigs and Bars—

Banca, pigs, ₩ D 26½@27 ¢
Straits, pigs, ₩ D 26½@27 ¢
Straits, in bars, ₩ D 27½@28 ¢

Tin Plates, American Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:

IC,	14 x 20	$7.50
1X,	14 x 20	9.00
1XX,	14 x 20	10.25
1XXX,	14 x 20	11.50
IXXXX,	14 x 20	12.75

Melyn Grade:

1C,	14 x 20	7.00
1X,	14 x 20	8.50
1XX,	14 x 20	9.75
1XXX,	14 x 20	11.00
IXXXX	14 x 20	12.25

Allaway Grade:

1C,	14 x 20	6.50
1X	14 x 20	7.60
1XX,	14 x 20	8.70
1XXX,	14 x 20	9.80
IXXXX,	14 x 20	10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight " " 1C, 14 x 20 $4.90@5.00
" " 1X, 14 x 20 $0.00

N. B.—The reduction per box on lighter Plates than 1C, 14 x 20, is as follows:

100 D 15¢
95 D 20¢
90 D 25¢
85 D 30¢

Terne Plates—

N. B.—The following prices are for 1C 20 x 28, the rate for 14 x 20 being half as much. 1X is usually held at $2 per box advance for 8 to 10 D coating and $2.50 to $3 advance for 15 D and upward.

About 40 D coating $16.00@16.50
About 30 D coating 15.25@15.75
About 20 D coating 13.25@13.75
About 15 D coating 11.25@11.75
About 8 D coating @10.00

Boiler Plates, American—

1XX, 14 x 26..(112 sheets) $12.50
1XX, 14 x 28..(112 sheets) 13.50
1XX, 14 x 31..(112 sheets) 15.00

Troughs, Eave—

See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz $13.00
Steel Lock Frame, per doz 18.00
Daisy Improved pattern, ₩ doz 18.00

Tubes and Tubing—

Brazed Brass, List June 6, 1898 40%
Copper and Bronze, 3c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb. 6, 1899
Tin 50%
Galvanized 50%
Fittings for do 40%

Zinc—

600 D casks ₩ D 6¾¢
Per D 7¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
30 gal 70&10%
35 and 40 gal 70%
Other sizes up to 52 gal 60@60&10%
52 gal. and above 60%
Extra Heavy Boilers:
18 to 52 gal 60%
53 gal. and above 55%

Brass Work, Plumbers'—

List of December 7, 1896.

Compression:
Basin Cocks 65%
Bath Cocks and Double Bath Cocks 65%
Bibs 65%
Bibs, Flanged 65%
Fuller:
Bibs 70%
Basin Cocks, Nos. 1 to 4 70%
Bath Cocks, No. 4½ $2.40 each net
Ground Key Work:
Finished Bibs 55&5%
Rough Bibs 70%
Rough Stop and Stop and Waste Cocks 70@70&5%
Rough Stop and Stop and Waste Cocks, Patented 65@05&5%

Miscellaneous—

Basin Clamps 60@65%
Basin Plugs 60@65%
Chain Stays 60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face, ₩ set	$0.95	$1.05
Ground Face ₩ set	$1.00	$1.10

Sink or Bath and Wash Tray Plugs 60@65%
Soldering Nipples 70&5@75%
Soldering Unions 70&5@75%
Union Elbows, Hot Water Heating 75@75&15%

Cocks, Valves, &c.—

Cocks—

Brass—

Air and Radiator Air 75@75&5%
Gas Meter and Union Meter 65@70%
Steam 65@70%

Iron—

All Iron 70@70&10%
Iron with Brass Plugs 65@70%

Valves—

Brass—

Check 65@70%
Garden Hose 65&10@70%
Gate 65@65&10%
Globe and Angle, hose outlet 65@65&10%
Globe, Angle and Cross 65&10@70&5%
Horizontal, Vertical and Angle Check 65@65&10%
Hot Water Radiator 75%
Radiator 70&10%
Safety 65%
Safety, Low Pressure 65%
Jenkins' Disc:
Check 65%
Gate 65%
Globe, Angle and Cross 70%
Radiator 80%
Radiator, Corner 75%
Safety 65%

Iron—

Iron Body 70@70&5%
Foot 65@70%
Jenkins Bros.':
All Iron, except Gate 40&5%
All Iron Gate 35@40%
Iron Body, except Gate 60%
Iron Body Gate 50@50&5%
Swing Check 50%

Earthenware—

Brown Glazed Wash Tubs 20%
Brown Glazed Sinks, Kitchen and Pantry 20%
Basins, Urinals and Hoppers 45%
Closet Bowls, Sundries, Washouts and Pedestals 50%

Fittings—

Brass Fittings—

Finished 70@75%
Rough 70@75%
Bushings 70@75%
Nipples 70@70&2½%
Unions, Rough and Finished 70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard Sizes 65@70%
Cast Iron Bushings and Plugs 05@75%
Cast Iron Flanges 65@70%
Cast Iron Floor Flanges 65@75%
Malleable Iron Fittings 70@75%
" " Bushings 70@70&10%
" " Unions 70&10@75%
" " Unions, Flange 60&10@70%
" " Pipe Hangers, Universal 50%
Wrought Iron Nipples 70@75%
" " Couplings 60@05%
" " Long Screws 60@65%

Lavatories—

Porcelain Enameled Iron 30@30&10%

Oakum—

Plumbers' Oakum, 50 lb. bales, ₩ D 2¼¢

Pipe—

Brass, Iron Pipe Size—

⅛	¼	⅜	½ to 3 Inch
$0.33	.31	.29	.23 ₩ D

Cast Iron Soil—

List Feb. 25, 1901.
2 to 6 inch inclusive.

Standard 50&10%
Extra Heavy 65%
All Fittings 70%

Wrought Iron—

List Feb. 15, 1900.

	Black.	Galv.
⅛ to ⅜ inch	57%	43%
½ to 12 Inch	64%	51%

NOTE.—*Manufacturers' prices are much lower than above, but prompt shipments are not obtainable.*

Radiators—

Standard List.

Steam 50&2½%
Hot Water 50%

Sinks, Etc.—

	Cast Iron—Black	Galv.
Sinks, Square, Half Round and Corner	60@05%	60@05%
Sink Legs	60%	60@65%
Sink Backs	00%	60@65%
Boiler Stands, Cast Iron	60@60&10%	
Cesspools, Cast Iron	6%	

Wrought Steel Sinks—

New Era, Galv'd and Enameled 70&5%
New Era, Painted 50&10%
L. & G 50%

Traps—

Drawn Lead Traps, List June 3, 1901 50&5%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns. Guaranteed. 45@50%
All Special Patterns 25%
Non-Guaranteed Brands, complete line 45@50%
Solid Copper, list of Feb. 1, 1899 40%
Solid Porcelain—Class A, 30%; B, 40%; C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899 50@55%

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Walworth Mfg. Co..... 1
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Weiss, H. & Co..... 79
Wheeler, W. A..... 77
Williams Stove Lining Co.... 25
Wister, L. & R. & Co..... 80
Wolff, L. Mfg. Co..... 26
Wood, Alan Co..... 78
Young, Jos. H..... 26
Zero Valve & Brass Mfg. Co.. 27

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STEEL, IRON, COPPER, ZINC, BRASS, TIN, and all other metals PERFORATED AS REQUIRED for

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Standard Sizes Perforated Tin and Brass Always in Stock.

The Harrington & King Perforating Co.,

Eastern Office. 284 Pearl St., NEW YORK. 217 North Union St., CHICAGO, ILLS., U.S.A.

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Carroll, J. B., Chicago, Ill.

Acetylene Gas Generators.
International Heater Co., Utica, N. Y.

Agricultural Furnaces.
Giblin & Co., Utica, N. Y.

Aluminum Ingots.
Janney, Steinmetz & Co., Phila., Pa.

Aluminum Scrap Buyers.
Janney, Steinmetz & Co., Phila., Pa.

Aluminum Sheets.
Janney, Steinmetz & Co., Phila., Pa.

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Edwards Mfg. Co., Covington, Ky.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, O.

Ball Cocks
Foster, F. W. Mfg. Co., Boston, Mass.

Bathtubs.
Day Metallic Mfg. Co., Detroit, Mich.

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American Tin Plate Co., New York.
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American Blower Co., Detroit, Mich.

Blowers.
American Blower Co., Detroit, Mich.

Boiler Handles.
Berger Bros. Co., Phila., Pa.

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Mueller, L. J. Furnace Co., Milwaukee, Wis.

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Koven, L. O. & Bro., 50 Cliff St., N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

Brass Goods
Jenkins Bros., 71 John St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Burners, Acetylene.
Carroll, J. B., Chicago, Ill.

CanMakers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Stiles & Parker Press Co., Brooklyn, N. Y.

Ceilings, Metallic.
Berger Mfg. Co., Canton, O.
Canton Steel Roofing Co., Canton, O.
Dowman Mfg. Co., Atlanta, Ga.
Eller, J. H. & Co., Canton, O.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Coal Vases.
Cincinnati Stamping Co., Cincinnati, Ohio.

Coils.
National Pipe Bending Co., New Haven, Conn.

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Berger Bros. Co., Philadelphia, Pa.
Clark, Quien & Morse, Peoria, Ill.
Lawronce-Letts Elbow Co., Ltd., Waverly, N. Y.
McClure & Co., Pittsburgh, Pa.

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Gummey, McFarland & Co., Phila., Pa.

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Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Machine & Tool Works, Buffalo, N. Y.
Ohl, Geo. A. & Co., Nowark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Poorman Mfg. Co., Piqua, O.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.

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Garry Iron & Steel Co., Cleveland, O.
Mullins, W. H., Salem, O.

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Cut Offs, Rain Water.
Cooney & Geiger, Indianapolis, Ind.

Dampers.
Arcade Mfg. Co., Freeport, Ill.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Curtis & Curtis Co., Bridgeport, Ct.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Dryers.
Sommer's, John Son, Newark, N. J.

Dumb Waiters.
Energy Elevator Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Reeves Mfg. Co., Canal Dover, O.

Eave Trough End Formers.
Bishop, G. E., Dowagiac, Mich

Eave Trough Hangers.
Berger Bros. Co., Phila., Pa.
Berger Mfg. Co., Canton, O.

Elbows, Stove Pipe.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Emery Wheels.
Scranton Corundum & Emery Wheel Co., Scranton, Pa.

Enameled Ware.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

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American Blower Co., Detroit, Mich.

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Clark Novelty Co., Rochester, N. Y.

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Preshrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Fire Pots.
Clayton & Lambert Mfg. Co., Detroit, Mich.
Wolff, L. Mfg. Co., Chicago, Ill.

Fire Sets.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Forming Machines.
Pocock, Oliver, Cincinnati, O.

Furnace Cement.
Perkins, J. L. & Co. Chicago.
Rutland Fire Clay Co., Rutland, Vt.

Furnace Pipe and Fittings.
International Heater Co., Utica, N. Y.
Osborn, J. M. & L. A., Cleveland, O.

Furnaces and Heaters.
Barstow Stove Co., Providence, R.I.
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Brand Stove Co., Milwaukee, Wis.
Brien Heater Co., Hoosick Falls, N. Y.
Dighton Furnace Co., Taunton, Mass.
Floyd, Wells & Co., Royersford, Pa.
Front Rank Steel Furnace Co., St. Louis, Mo.
Giblin & Co., Utica, N. Y.
Hart & Crouse Co., Utica, N. Y.
Hess-Snyder Company, Massillon, Ohio.
International Heater Co., Utica, N. Y.
Kelsey Heating Co., Syracuse, N. Y.
Lennox Mannfacturing Co., Marshalltown, Iowa.
Magee Furnace Co., Boston, Mass.
Mueller, L. J. Furnace Co., Milwaukee, Wis.
Peck Williamson Co., Cincinnati, O.
Richmond Stove Co., Norwich, Conn.
Robinson Furnace Co., Chicago, Ill.
Schwab, R. J. & Sons Co., Milwaukee, Wis.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Ct.
Stanton Heater Co., Martins Ferry, O.
Thatcher Furnace Co., 240 Water St., N. Y.
Utica Heater Co., Utica, N. Y.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Granite Steel Ware.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Groovers.
Poorman Mfg. Co., Piqua, O.
Wheeler, W. A., Indianapolis, Ind

Gutter Formers.
Double Truss Cornice Brake Co., Buffalo, N. Y.

Hack Saws
Millers Falls Co., 28 Warren St., N. Y.

Heaters, Steam and Hot Water.
Barstow Stove Co., Providence, R.I.
Dighton Furnace Co., Taunton, Mass.
Drake, W. H., Newark, N. J.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Gurney & Co., Boston, Mass.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
International Heater Co., Utica, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Magee Furnace Co., Boston, Mass.
Mueller, L. J. Furnace Co., Milwaukee, Wis.
National Pipe Bending Co., New Haven, Conn.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.
Richmond Stove Co., Norwich, Conn.
Sheppard, Isaac A. & Co., Phila., Pa.
Smith, H. B. Co., Westfield, Mass.
Smith & Anthony Co., Boston, Mass.
Smith & Thayer Co., Boston, Mass.
Stolz, Frank D., Chicago Ill.
Thatcher Furnace Co., 240 Water St., N. Y.
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Vance Boiler Works, Geneva, N. Y.
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Sperry, D. R. & Co., Batavia, Ill.

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Amer. Sheet Steel Co., New York.

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Garry Iron & Steel Co., Cleveland, O.

Lath, Metallic.
Schratwiesers Metal Lath Works.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

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Seavey Mfg. Co., Boston, Mass.

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Asheville Mica Co., Asheville, N. C.
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Palermo Mica Co., 115 Beekman St., N. Y.
Rutland Fire Clay Co., Rutland, Vt.

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National Enameling & Stamping Co., 78 Beekman St., N. Y.

Oil Heaters. (*See Stoves and Ranges, Oil, Vapor and Gasoline.*)

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Blodgett, G. S. Co., Burlington, Vt.
Monarch Stove & Mfg. Co., Mansfield, Ohio.

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Cope, Geo. W., Detroit, Mich.
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Vedder Pattern Wks., Troy, N. Y.

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Harrington & King Perforating Co., Chicago, Ill

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Wister, L. & R. & Co., Philadelphia, Pa.

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Curtis & Curtis Co., Bridgeport, Ct.
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Callahan, Geo. & Co., 218 Front Street, N. Y.

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Walworth Mfg. Co., Boston, Mass.

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Millar, C. & Son Co., Utica, N. Y.

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Anderson Coupling Co., Portland, Ct.
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Clayton & Lambert Mfg. Co., Detroit, Mich.
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Foster, F. W. Mfg. Co., Boston, Mass.
National Pipe Bending Co., New Haven, Conn.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.
Walworth Mfg. Co., Boston, Mass.
Wolff, L. Mfg. Co., Chicago, Ill.
Young, Jos. H., Boston, Mass.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Pliers, Pipe Expanding.
Anderson Coupling Co., Portland, Ct.

Pokers and Lifters.
Arcade Mfg. Co., Freeport, Ill.
Shields, W. H. & Co., Troy, N. Y
Troy Nickel Works, Troy, N. Y.

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Vogel, Wm. & Bros., 37 to 47 S. 9th St. Brooklyn, N. Y.

Press Work.
Kirk Mfg. Co., Toledo, O.

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Bliss, E. W. Co., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.

Pumps.
Hess-Snyder Company, Massillon, Ohio.
Lawless, John H., Jersey City, N. J.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.

Radiators, Hot Air.
Burton, W. J. & Co., Detroit, Mich.
Independent Register Co., Cleveland, Ohio.
Selleck, A. C., Chicago, Ill.

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Gurney Heater Mfg. Co., Boston, Mass.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.

Range Boilers.
Koven, L. O. & Bro., 50 Cliff St., N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

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Frink, I. P., 551 Pearl St., New York.

Refrigerators.
Cooper & McKee, Brooklyn, N. Y.
Gurney Refrigerator Co., Fond du Lac, Wis
Illinois Refrigerator Co., Morrison, Ill.

Registers.
Canton Steel Roofing Co., Canton, O.
Dighton Furnace Co., Taunton, Mass.
Independent Register Co., Cleveland, Ohio.
Seavey Mfg. Co., Boston, Mass.

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Asphalt Ready Roofing Co., 136 Water St. N. Y

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Callahan, Geo. & Co., 218 Front Street, N. Y.
Dixon, Jos. Crucible Co., Jersey City N. J.
Perkins, J. L. & Co., Chicago.
Rutland Fire Clay Co., Rutland, Vt.

Roofing Cork.
Stowell Mfg. Co., Jersey City, N. J.

Roofing Edger.
Danzer Metal Works, Hagerstown, Md.

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Berger Mfg. Co., Canton, O.
Burton, W. J. & Co., Detroit, Mich.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Co., Cleveland, O.
Gnmmey, McFarland & Co., Phila., Pa.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Reeves Mfg. Co., Canal Dover, O

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Salem Nail Co., 279 Pearl St., N. Y.

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Galt, John & Sons, 253 Broadway, N. Y.
Genuine Bangor Slate Co., Easton, Pa.
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O'Halloran & Jacobs, Pittsburgh, Pa.

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Millar, C. & Son Co., Utica, N. Y.

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International Correspondence Schools, Scranton, Pa.

Screens.
Harrington & King Perforating Co., Chicago, Ill.

Sewer Pipe.
Rutland Fire Clay Co., Rutland, Vt

Shears, Sheet Metal
McSherry, Chas., Pittsburgh, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y
Keene Geo. C. & Co., Cincinnati, O.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Pocock, O., Cincinnati, O.
Poorman Mfg. Co., Piqua, O.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Stiles & Parker Press Co., Brooklyn, N. Y.

Sheets, Galvanized.
American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
McClure & Co., Pittsburgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Alan Co., Philadelphia, Pa.

Sheets, Iron and Steel.
American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Co., Alan, Philadelphia, Pa.

Shingles and Tiles, Metallic.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

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Skylights.
Canton Steel Roofing Co., Canton, O.
Dronve, G. Co., Bridgeport, Conn.
Mullins, W. H., Salem, O.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 279 Pearl St., N. Y.

Snow Guards.
Clason Arch. Metal Works, Providence, R. I.

Solder.
Bruce & Cook, 186 to 190 Water St., NY
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties, Sheet Metal.
Vogel, Wm. & Bros., Brooklyn, N. Y.

Statuary, Sheet Copper and Bronze.
Mullins, W. H., Salem, O.

Steam and Gas Fitters' Supplies.
Curtis & Curtis Co., Bridgeport, Conn.
Walworth Mfg. Co., Boston, Mass.

Steam and Water Engineering and Regulating Specialties.
Kieley & Mueller, 7-11 West 13th St., N. Y.

Steel Shapes.
Cambridge Rolling Mill Co., Cambridge, Ohio.

Steel Stamps and Stencil Dies.
Schwerdtle Stamp Co., Bridgeport, Ct.

Stove Bands.
Kirk Mfg. Co., Toledo, O.

Stove Cement.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Rutland Fire Clay Co., Rutland, Vt.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.
Hoffman, Geo. W., Indianapolis, Ind.
Rutland Fire Clay Co., Rutland, Vt.

Stove Patterns.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Milwaukee Pattern Works, Milwaukee, Wis.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
O. K. Mfg. Co, Buffalo, N. Y.

Stove Repairs.
Clark, Henry N. Co., Boston, Mass.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Arcade Mfg. Co., Freeport, Ill.

Stoves and Ranges.
Barstow Stove Co., Providence, R. I.
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Brand Stove Co Milwaukee, Wis.
Champion Steel Range Co., Cleveland, Ohio.
Dighton Furnace Co., Taunton, Mass
Enterprise Stove Co., Vincennes, Ind.
Floyd, Wells & Co., Royersford, Pa.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co., Utica, N. Y.
Gurney & Co., Boston, Mass.
Hess-Snyder Company, Massillon, O.
Joliet Stove Works, Joliet, Ill.
Magee Furnace Co., Boston, Mass.
Pittsburgh Stove & Range Co., Pittsburgh, Pa.
Quincy Fdry. & Novelty Co., Quincy, Ill.
Richmond Stove Co., Norwich, Conn.
Ringen Stove Co., St. Louis, Mo.
Sohneider & Trenkamp Co., Cleveland, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Smith & Anthony Co., Boston, Mass.
Stamford Foundry Co., Stamford, Ct.
Thatcher Furnace Co., 240 Water St., N. Y.
Weir Stove Co., Taunton, Mass

Stoves and Ranges, Gas.
Adler, H. & Co., Pittsburgh, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Dangler Stove & Mfg. Co., Cleveland, Ohio.
Dighton Furnace Co., Taunton, Mass.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Stoves and Ranges, Oil, Vapor and Gasoline.
Clark, Geo. M. & Co., Chicago, Ill.
Dangler Stove & Mfg. Co., Cleveland, Ohio.
Heath, C. C. & Co., Philadelphia, Pa.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
National Vapor Stove & Mfg. Co. Lorain, O.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, O
Standard Lighting Co., Cleveland, O.

Street Lamps, Gasolene.
Merkel, H., St. Louis, Mo.

Tanks, Steel and Wood.
Edwards, J. H., 59 Park Place, N. Y.

Terne Plates.
American Tin Plate Co., New York.
Taylor, N. & G. Co., Phila., Pa.

Tinners' Tools, Machines and Supplies.
Berger Bros. Co., Phila., Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn N. Y.
Weiss, H. & Co., 20 Cliff St., N. Y.

Tinners' Trimmings.
Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate.
American Tin Plate Co., New York.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

Tin Scrap.
Vulcan Metal Refining Co., 157 Cedar St., N. Y.
Vulcan Western Co., Streator, Ill.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis Co., Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Torches, Plumbers.
Clayton & Lambert Mfg. Co., Detroit, Mich.

Tubing.
Kirk Mfg. Co., Toledo, O.

Valves.
Am. Steam Gage & Valve Mfg. Co., Boston, Mass.
Crosby Steam Gage & Valve Co., Boston, Mass.
Jenkins Bros., 71 John St., New York.
Morgan & Co., Chicago.

Ventilating Apparatus.
American Blower Co., Detroit, Mich.

Ventilators and Chimneys.
Iwan Bros., Streator, Ill.

Ventilators and Chimney Caps.
Berger Bros. Co., Phila., Pa.
Dowman Mfg. Co., Atlanta, Ga.
Fenn, Geo. E., Boston, Mass.
Globe Ventilator Co., Troy, N. Y.
Kramer Bros., Dayton, O.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Marston, I. G. & Co., Boston, Mass.

Washing Machines.
Boss Washing Machine Co., Cincinnati, Ohio.
Wayne, Anthony Mfg. Co., Ft. Wayne, Ind.

Water Coolers.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Water Fronts.
Clark, Henry N. Co., Boston, Mass.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.
Miner & Peck Mfg. Co., New Haven, Ct.

Wiping Cloths.
Allbe, Chas. A., Springfield, Mass

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Original letters of reference should not be inclosed with replies to advertisements appearing in these columns as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

First-class STOVE PATTERN FITTER; to right man good wages and steady employment. Pennsylvania Stove Company, Ellwood City, Pa. Mar. 1

A thorough PLUMBER, with some knowledge of furnace work and house spouting, can find permanent position with B. F. Robinson & Co., Mt. Vernon, Iowa. Mar. 1

A position at the South is open for an industrious, sober and reliable man, competent to do good and satisfactory work in tinning (roofing), plumbing and bicycle repairing. Address, with recommendations and wages expected, N. Christensen, Beaufort, S. C. Mar. 1

At once, a first-class TINSMITH; preference to a man who can do plumbing, gas and steam fitting; union shop; nine-hour day; steady work to satisfactory man; state wages and experience. G. E. Adams & Co., Glens Falls, N. Y. Mar. 1

Good, steady man to FOLLOW-BOARD STOVE PATTERNS, also make FLASKS. Indianapolis Stove Company, Indianapolis, Ind. Mar. 1

SUPERINTENDENT for stove concern with knowledge of molding, mounting, nickel plating and general finishing of stoves, both cast and steel; must have executive ability to manage men and get work out to advantage; state experience, age, references and salary expected. Box 26, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Mar. 1

An experienced SALESMAN visiting the hardware and stove trade for New York and the New England States, to sell a standard line of high grade air tight heaters for wood, as a side line, on commission; only first-class men with experience in this territory need apply; state territory covered. Box 88, Quincy, Ill. Mar. 1

WORKING FOREMAN in large manufacturing concern who are adding to their line the manufacture of copper washboilers and other sheet copper goods; good chance for the right man. Box 451, Pittsburgh, Pa. Mar. 1

SALESMAN acquainted with New York City stove trade; must have experience and know the trade; state age and experience. "New York," care *The Metal Worker*, New York. Mar. 1

AT ONCE, two first-class TINSMITHS; must be sober and industrious; good wages and steady work to the right men. Bennett & Dunn, Sharon, Pa. Mar. 1

An experienced SALESMAN wanted to sell a large line of stoves, ranges, oil and gas stoves, in Pennsylvania, New Jersey and Delaware on commission or salary; state full particulars and wages required. "G. R. S.," care *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Mar. 1

A first-class PLUMBER, TIN and SHEET IRON WORKER, with knowledge of hot air, steam and hot water heating; must be sober; state experience, references and wages expected. C. B. Jacobs & Son, Hollidaysburg, Pa. Mar. 1

A FOREMAN, thoroughly competent to handle a foundry employing 100 molders on a variety of work, principally sanitary; must be an up to date man and conversant with the latest improved methods; give full particulars as to experience and salary. "X. Y. Z.," P. O. Box 672, New York. Mar. 1

SHEET METAL WORKERS; steady work for reliable men. U. S. Headlight Company, Buffalo, N. Y. Mar. 1

SHOP FOREMAN; modern cornice shop; must be fully alive to modern conditions and ways of doing business; well up in drafting, good executive ability and practical experience. "Shop Foreman," care *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Mar. 1

STOVE SALESMEN to represent Chicago house in Iowa, Nebraska, Illinois, Indiana, Texas and Pacific Coast points. Box 30, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Mar. 1

MOUNTING ROOM FOREMAN in Chicago factory. Box 29, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Mar. 1

For a first-class country shop about 30 miles from New York City, a strictly sober and steady TINSMITH; one that can cut patterns, make furnace casings and fittings and erect them in a neat and mechanical manner; must be an all around hand, good at bench work and outside tinning; to such a man we offer a first-class job; state age, married or single and wages wanted. "Mechanic," care *The Metal Worker*, New York. Mar. 1

A good, sober PLUMBER and TINNER; steady work; married man preferred; must come well recommended; state wages. Box 223, Tell City, Ind. Mar. 1

TINNER; one who understands all kinds of shop and furnace work; young married man preferred; good wages to the right man. O. Kniscly & Son, New Philadelphia, Ohio. Mar. 1

A good all around TIN and SHEET METAL WORKER who can cut and lay out his own patterns and take quantities from plans when necessary; none but first-class men need apply. Frank R. Jarrell, corner Spring and Main streets, Lexington, Ky. Mar. 1

Fifteen first-class STOVE MOUNTERS to work on gas ranges. Abendroth Bros., Port Chester, N. Y. Feb. 22

A first-class SALESMAN to represent a good selling, modern line of stoves, ranges and furnaces in Eastern Pennsylvania. "Eastern Pennsylvania," care *The Metal Worker*, New York. Feb. 15

FOUNDRY SUPERINTENDENT with knowledge of molding; must have executive ability to manage men and get work out to advantage: special experience in our line of work not required; state experience, age and references; good position and salary for right man. Richmond Stove Company, Norwich, Conn. Feb. 8

SITUATIONS WANTED.

By PLUMBER, STEAM and HOT WATER FITTER; graduate of New York Trade School's plumbing class; have had ten years' experience in work of the best quality; married, steady and reliable; 27 years of age; can furnish excellent references as to character and ability if desired. H. Emmett Phelps, Bernardsville, N. J. Mar. 1

A PLUMBER of over 20 years' experience; first-class lead worker; sober and reliable; understands steam and hot water heating; out of employment. George McLean, 321 East Twenty-fourth street, New York. Mar. 1

By a first-class PLUMBER, LOW PRESSURE STEAM and HOT WATER FITTER; married man, 30 years old, reliable, best of reference; position wanted with firm who can take boy 18 years old as apprentice. "E. S. D.," care *The Metal Worker*, New York. Mar. 1

A married man, 30 years of age, sober; can estimate and do all kinds of steam, hot water and gas fitting, jobbing in plumbing and roofing; understands pumps; can make himself useful in country shop where steady position is offered near New York City. "Frauices," care Lange, 306 West Fifty-fourth street, New York. Mar. 1

By a good all arouud road mechanic on the erection of blowers and blow pipe; accustomed to working from drawings and handling men; good references; sober and reliable. "Sheet Metal Worker," 4945 Girard avenue, Philadelphia, Pa. Mar. 1

BOOKKEEPER; 15 years' experience in retail and wholesale stove, tinware and house furnishings store, also in manufacturing department; thoroughly competent; best of refereuccs; age 37; married. Box 4, Chattanooga, Tenn. Mar. 1

By PLUMBER and GAS FITTER; first-class; union man; will go anywhere. Edw. F. Walsh, 407 East Eighty-first street, New York. Mar. 1

As SALESMAN for a hardware or tin firm; have been in the hardware, stove and tin retail business for nearly 30 years and would like to try it on the road; would like to travel in Ohio; good reference furnished if desired. Box 177, Crestline, Ohio. Mar. 1

By young man, 33 years of age, practical TINSMITH and STOVE MAN, as salesman in some good, reliable stove house, retail or wholesale; will take a position as traveling salesman. F. W. Drew, Chester, N. Y. Mar. 1

By a young man, 24 years of age, with three years' experience at plumbing, tin roofing, spouting and tinsmithing; would like a chance to finish the trade; sober and reliable; don't expect big wages. O. Loomis, 5 Royal avenue, North Adams, Mass. Mar. 1

By a general TINNER and FURNACEMAN; can lay out work and estimate on same; eight years' experience; strictly temperate and reliable; will work at reasonable wage for steady position. "M. A.," 645 Seventeenth street, Detroit, Mich. Mar. 1

PLUMBER, JR.; young man, 24; A1 mechanic; wishes job in nearby country town. "Plumber," 944 Tinton avenue, New York. Mar. 1

By a SALESMAN of 15 years' experience in plumbers' and steam fitters' supplies; six years in the retail trade and eight years as traveling salesman through New England. "T. E.," Box 288, Westboro, Mass. Mar. 1

By a good all around country PLUMBER; steady position, city or country. Box 8, Ridgefield, Conn. Mar. 1

By a first-class TINNER, SHEET IRON WORKER, ROOFER and GENERAL JOBBER; have some knowledge of plumbing, also can clerk in hardware and stove store; can furnish first-class reference. "L. W.," P. O. Box 43, Prattsville, N. Y. Mar. 1

By first-class PLUMBER and FITTER, STEAM and WATER; also tinner. J. D. Abrams, 25 Franklin street, Hempstead, N. Y. Mar. 1

By young man as TINNER and METAL WORKER; understands lamp repairing and mounting and metal spinning; five years' experience. Address L. J. Huber, 926 Laurel street, Cincinnati, Ohio. Mar. 1

By first-class PLUMBER; city or country. James Tyler, 321 West Forty-third street, New York. Mar. 1

By PLUMBER, 24 years of age, seven years' experience; understands plumbing in all its branches. Walter T. Hawkins, 17 Sprague avenue, Middletown, N. Y. Mar. 1

By a TIN, SHEET IRON, RANGE and FURNACE WORKER, a steady job where a good all around mechanic would be appreciated; sober and married. G. Walter Bange, General Delivery, P. O., Baltimore, Md. Mar. 1

By a practical, energetic cornice maker as CUTTER or WORKING FOREMAN. "E. J.," 180 South Third street, Brooklyn, N. Y. Mar. 1

By a first-class PLUMBER and GAS FITTER; can do all kinds of sanitary plumbing; can also do any kind of outdoor tinning; give particulars. John Cave, 3709 Virginia avenue, Newport News, Va. Mar. 1

A first-class, sober, honest, industrious TINSMITH, SHEET IRON WORKER and FURNACEMAN, wishing to make a change of locality, is open to engagement as working foreman in a first-class tin shop; 15 years in country shop, two years as foreman in city shop; best of references. "J. B.," 1364 Brook avenue, New York. Mar. 1

Two first-class PLUMBERS, union men, will work in any State in the Union; temperate, honest and reliable. "W.," care P. Whalen, 352 East 116th street, New York. Mar. 1

By an American, 25 years' experience at tin and furnace work, jobbing of all kinds; can estimate and manage help if required; Rhode Island or Massachusetts preferred. "Furnace," care *The Metal Worker*, New York. Mar. 1

As SUPERINTENDENT and CUTTER; long experience as manager of help; correct in estimates on galvanized iron cornice and skylights, tin and slate roofing, water tanks, blow pipe, furnace work and general sheet metal work; strictly sober and reliable and up to date. "Sheet Metal Worker," care *The Metal Worker*, New York. Mar. 1

A steady position by a first-class PLUMBER, TINSMITH and FURNACEMAN; can also do steam and hot water heating; understand stoves, hardware, foundry implements; good salesman; can give the best of reference; seven years with last employer, 15 years at the trade; or I would go to work for some good paying concern with a view to buying an interest. Willard B. Wilson, North Brookfield, Mass. Mar. 1

By young man as TINNER and METAL WORKER for inside work; practical lamp mounting and repairing, metal spinning, &c.; five years' experience. L. Jacob Huber, 926 Laurel street, Cincinnati, Ohio. Mar. 1

By a young man, single, experienced in cornice and skylights, little experience in drawing and cutting patterns; would like to get a steady job, city or country. J. Deutch, 332 East Houston street, New York. Mar. 1

By a first-class PLUMBER and GAS FITTER, city or country; can furnish best of references; strictly temperate. "H. M.," care *The Metal Worker*, New York. Mar. 1

As SUPERINTENDENT or FOREMAN, by practical enameler; many years' experience as enameler on sheet iron and steel ware; have own formulas. "Enameler," care *The Metal Worker*, 1205 Chemical Building, St. Louis, Mo. Mar. 1

SALESMAN, 42 years, educated, intelligent, temperate; over 20 years' experience in stove, range and furnace trade; open for 1902; for 15 years past have traveled Pennsylvania, New Jersey, Delaware, Maryland, Virginia, New York and New England States; an economical traveler and conscientious, persistent worker. Edward D. Purves, Box 45, Parkertown, N. J. Feb. 22

A position as PLUMBER; first-class workman; sober, reliable; references; any State west of Chicago; union man. Box 19, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 22

As CLERK in retail hardware or stove store; ten years' experience; can furnish best of references; would like position by March 1. "Clerk," care *The Metal Worker*, New York. Feb. 15

A convincing, energetic business increasing SALESMAN with ability, good address and habits; 15 years' experience in stove, sheet metal and plumbing and heating line; expert solicitor, estimator and supervisor; lay out man on steam, hot water and hot air heating. "Estimator," care *The Metal Worker*, New York. Feb. 22

A young man of several years' experience in foundry would like to travel for any well established firm in hardware; stoves preferred; no experience; present occupation steel range maker. Box 22, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 22

A practical PLUMBER and GAS FITTER of 12 years' experience in small sized town; at present employed in large city; neat and careful workman; sober, reliable and 30 years of age; married; best of references furnished. Box 21, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Feb. 22

By STEAM and HOT WATER FITTER who can do plumbing, pump work and gas fitting; strictly sober; can furnish best of references; can go anywhere. Box 1233, Corry, Erie County, Pa. Feb. 22

By A1 TIN and SHEET IRON WORKER with 17 years' experience; is good at bench or outside work; can lay out his own patterns; is married; would like steady position with some good firm. Jos. Kelly, 446 Second street, Niagara Falls, N. Y. Feb. 22

BOILER SALESMAN with extensive acquaintance with trade in Pennsylvania is open for position; thoroughly experienced in construction, estimating and soliciting; has a good trade and can furnish unquestioned reference; can guarantee results. "J. A. L.," care *The Metal Worker*, New York. Feb. 22

Man (26), single, strictly sober, speaking German, wants steady position, city or country, where he could finish trade; has three and a half years' experience in plumbing, tinning and steam fitting trade; can do jobbing; if possible board with employer; first-class references. "A. S.," care of Steinert, 78 East Ninety-sixth street, New York. Feb. 22

By temperate, reliable young man (25), at PLUMBING, GAS FITTING and GENERAL JOBBING, six years' experience; some knowledge of tin roofing and spouting; city or country work. "P., Plumber," care Box 306, Bridgewater, Mass. Feb. 22

First-class PLUMBER and GAS FITTER wants work; city or country; 12 years' experience. J. O'Hare, 459 West Thirty-fifth street, New York. Feb. 22

By young man with two and a half years' experience at the tinsmith trade; would like to finish learning trade with good man; am sober and willing. Harry Milden, Marlboro, N. Y. Feb. 22

By young man, 22, with several years' experience with local stove and tinware house, as SALESMAN or SHIPPING CLERK or on the road; good references. "Billy," 600 Fifth street, Lynchburg, Va. Feb. 22

By a first-class TINSMITH having 12 years' experience in cornice and furnace work, also able to estimate on all styles of work; country town in Central States preferred. "P. A. C.," care Columbian Novelty Company, 921 Franklin avenue, St. Louis, Mo. Feb. 22

By young man, 21 years old, with some reliable party; is willing to work in any State in the Union if wages are good; have A1 reference, can also give $50 security if required. T. J. McKenna, 48 Montauk avenue, Brooklyn, N. Y. Feb. 22

By a sober and reliable TINSMITH having ten years' experience at the trade on roofing, spouting, tinware and general jobbing, also considerable knowledge of plumbing and steam heating; wages, $11 per week for steady position. "T. G.," Rockville, Conn. Feb. 22

BOOKKEEPER, age 30, single, thoroughly experienced in manufacturing line; up to date methods; all around man; can install good cost system; capable of taking charge of office; exceptional references; salary required, $20 per week. "W. S.," care *The Metal Worker*, New York. Feb. 22

Steady position by all around SHEET METAL WORKER; 16 years' experience in cornice, furnace, skylight and heavy riveted work; can cut and lay out work or take charge of shop. "B. W.," care *The Metal Worker*, New York. Feb. 22

By FOREMAN in hot air furnace or job shop; good at plumbing, steam fitting and all kinds of tin work in and outside; 19 years' experience. Wm. Jones, rear of 406 St. Clare street, Cleveland, Ohio. Feb. 22

By a young man, 33 years of age, practical PLUMBER and GAS FITTER; 18 years' experience at the trade; licensed and registered by the New York Board of Health and Department of Public Works; has had charge of men; can figure from and read plans; would like position as journeyman or take charge of work. Address, with full particulars, P. H. Becker, 1980 Daly avenue, New York. Feb. 22

By first-class PLUMBER, PIPE FITTER and FURNACE WORKER; 15 years' experience; sober and industrious; wages, $2.50 a day; city or country. James Yancer, 531 Grant avenue, Van Nest Park, New York. Feb. 22

FOR SALE.

One 8 ft. Robinson Geared Power Brake. This brake is practically new and can be bought at a bargain by any one who can use it.

Address "BRAKE,"
Care *The Metal Worker*, New York.

WANTED.

Second-hand Tinsmiths' Tools as follows: one 20 in. Bar Folder, one 20 in. Groover, one large Burring Machine with standard, one Wright's Patent Sheet Iron Folder, one Stove Pipe Former, 30 in. long.

ANTRIM IRON CO.,
Mancelona, Mich.

FOR SALE.

A Plumbing, Heating, Stove and General Jobbing Business in a growing town. Stock will run about $1500. Good reasons for selling. Address
JNO. L. WHITE, Flairstown, N. J.

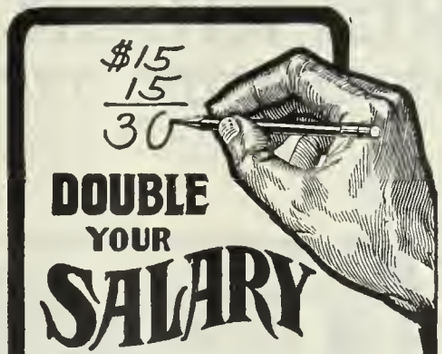
FOR SALE.

On account of other business, I offer for sale my well established first-class Plumbing, Heating and Tin Business in one of the busiest cities of New England, a few miles out of Boston. Address "A. L.," care *The Metal Worker*, New York.

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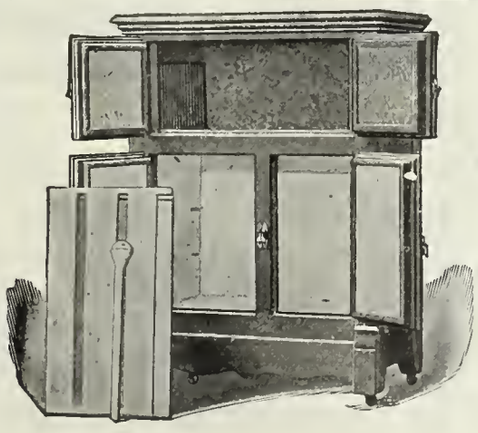
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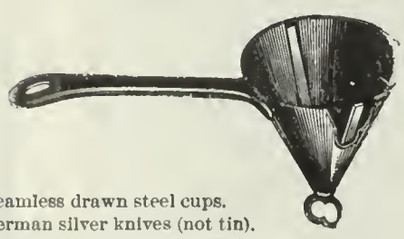
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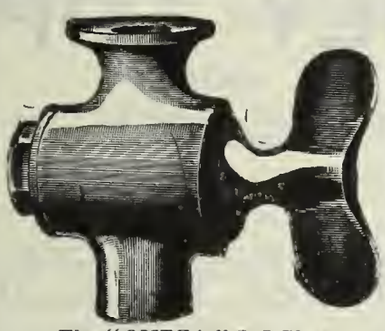
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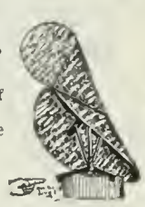
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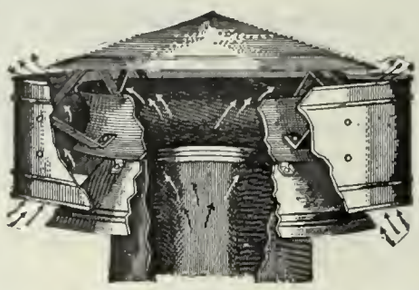
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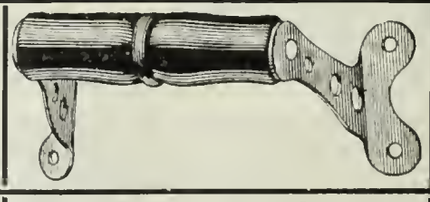
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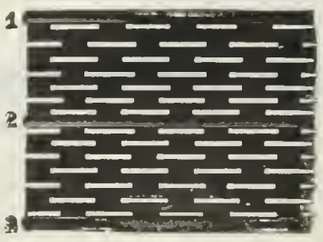


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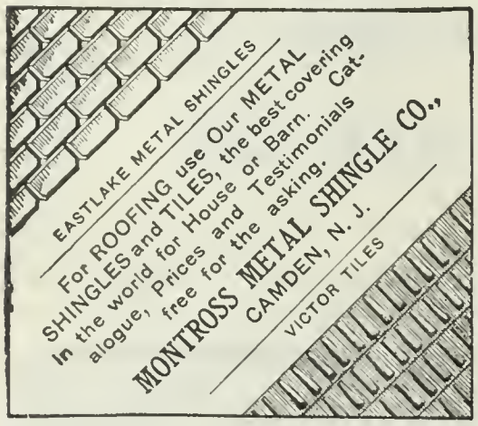


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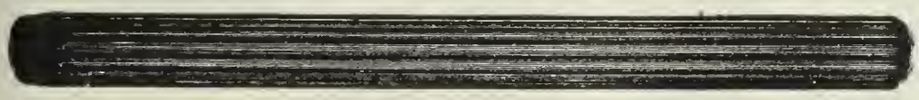
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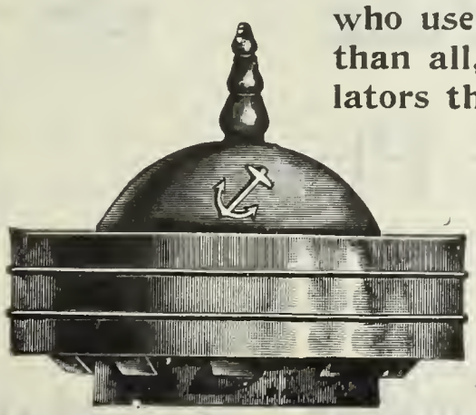
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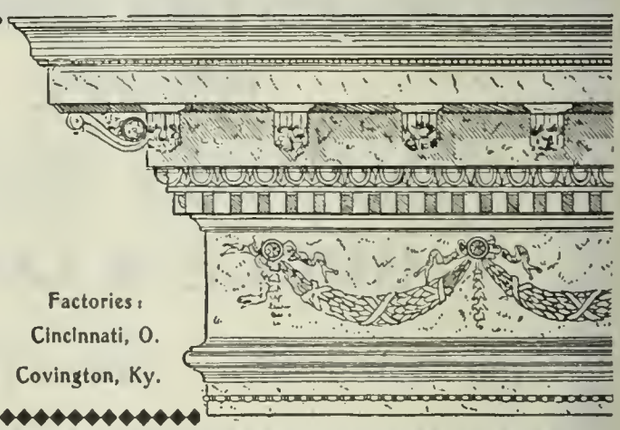
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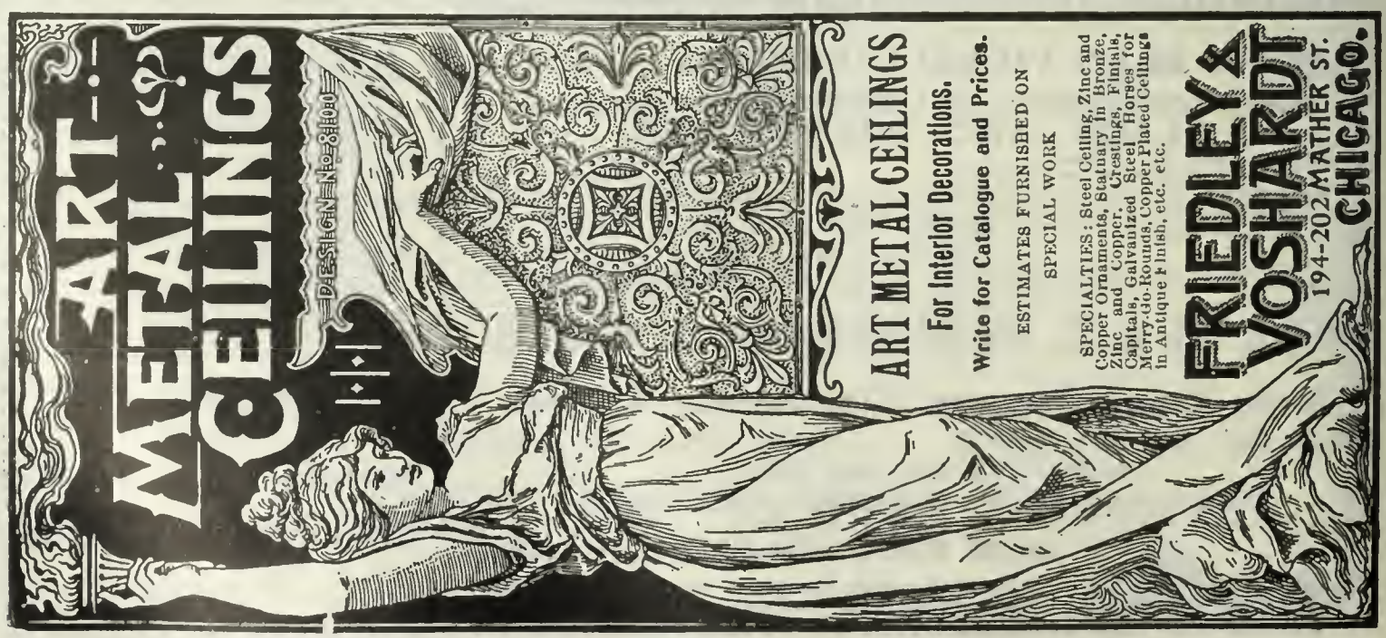
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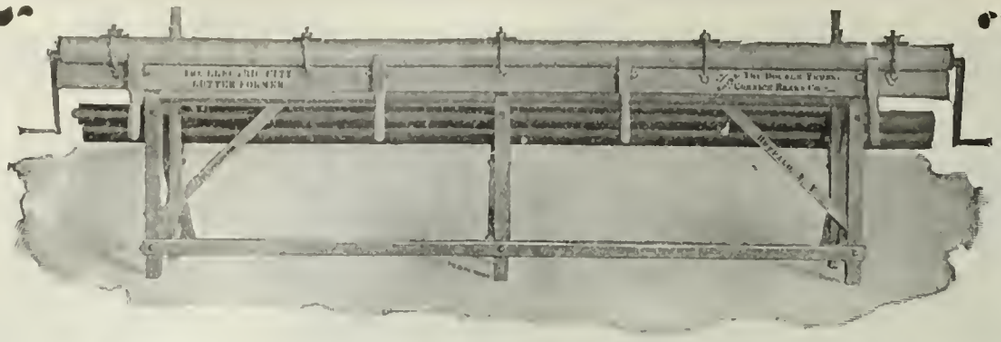
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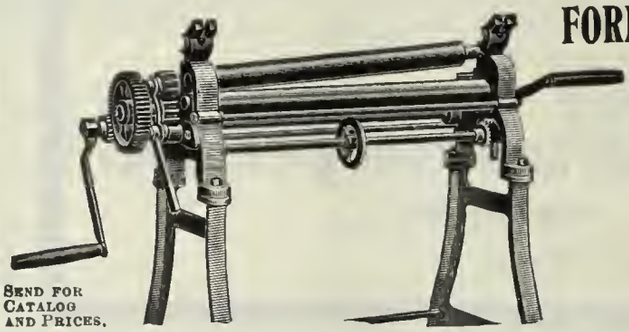
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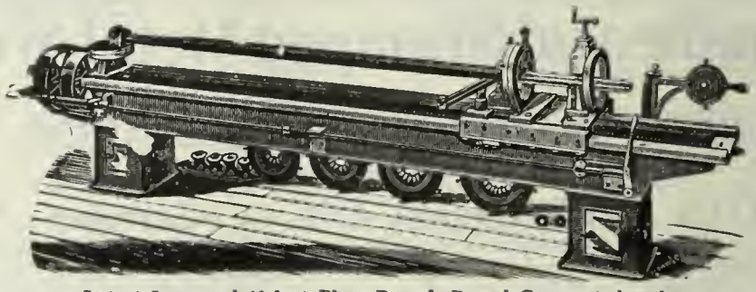
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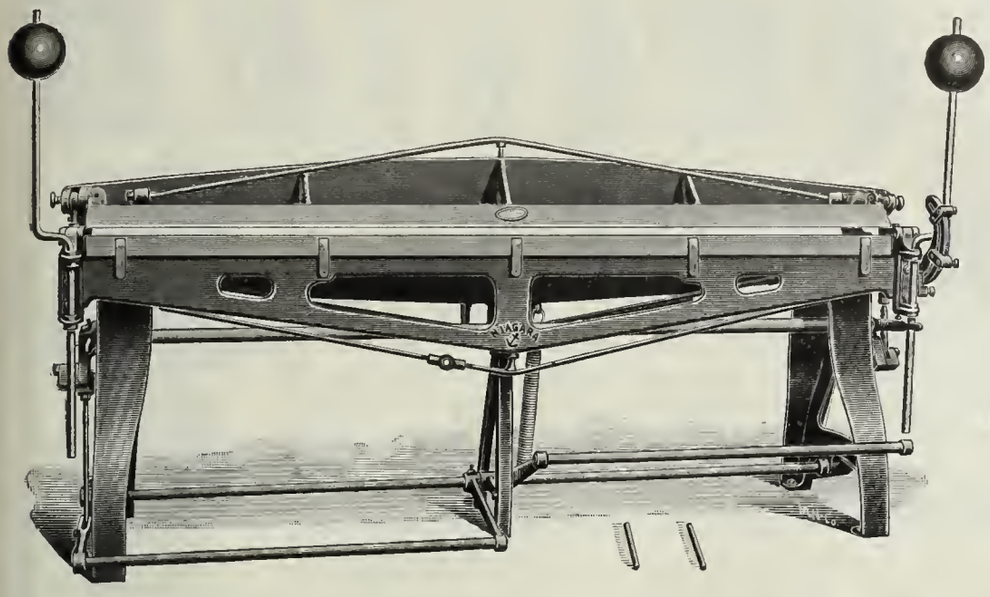
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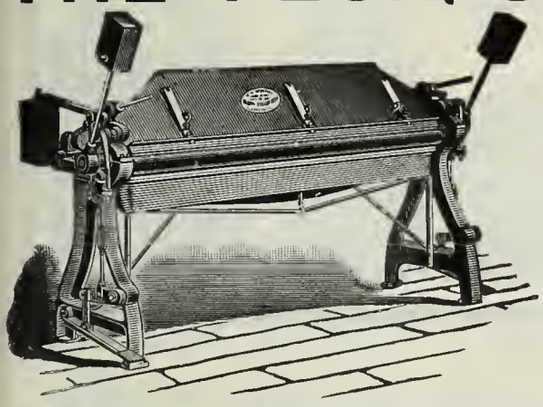
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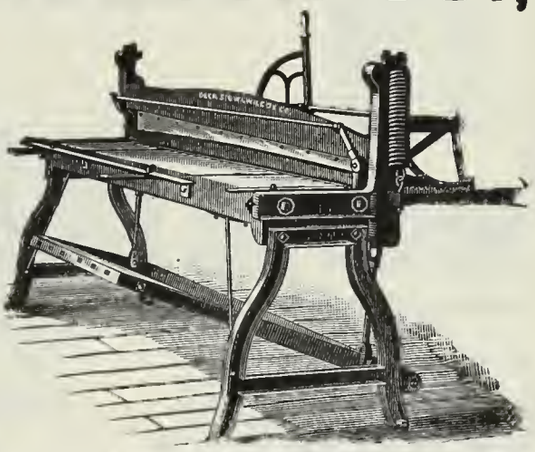
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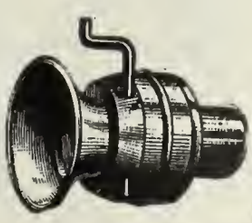
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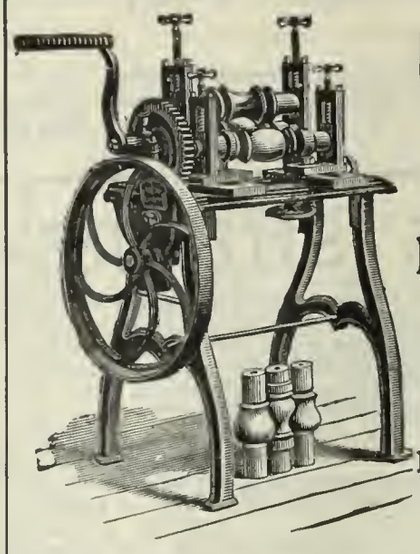
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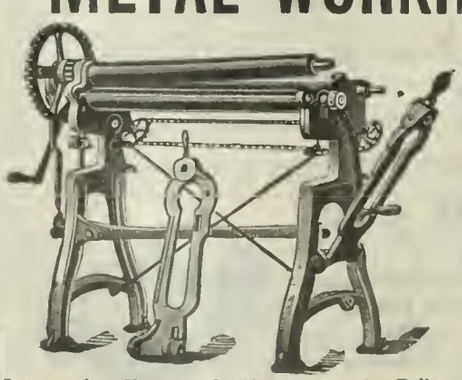
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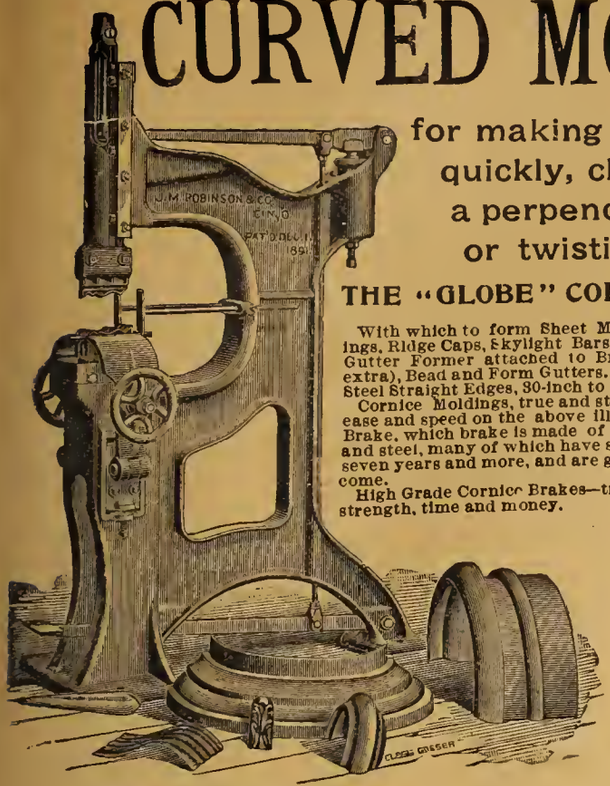
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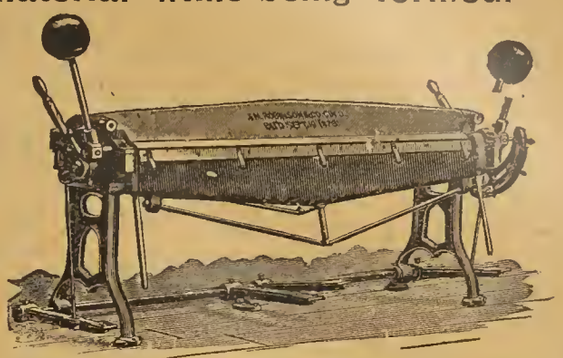
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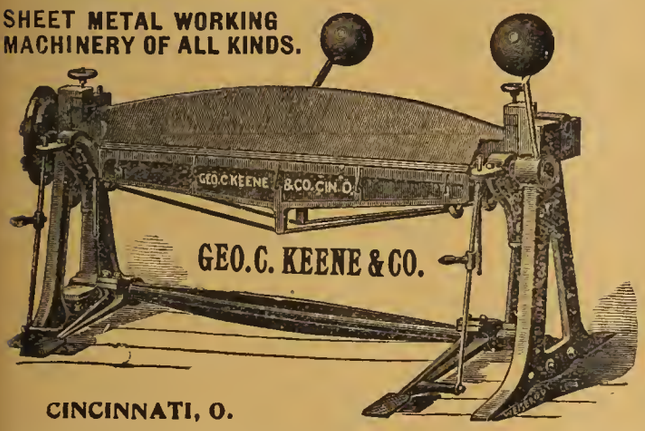
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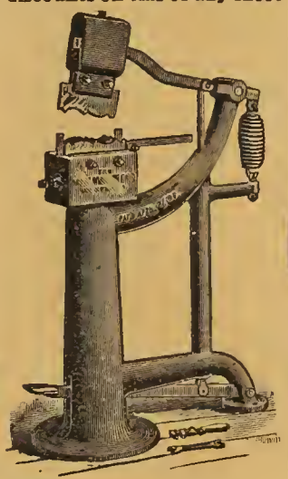


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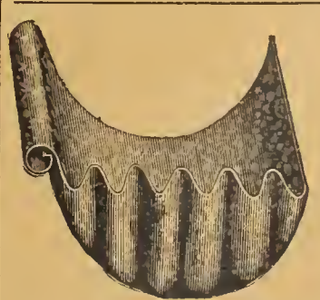
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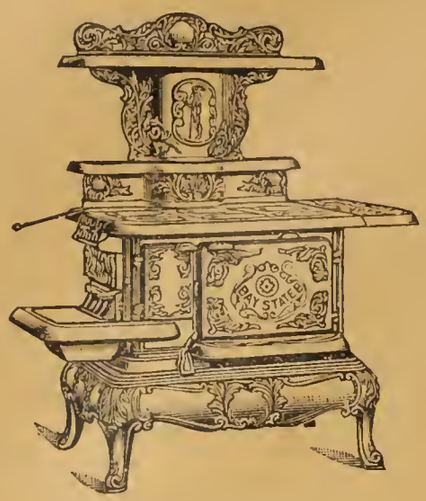
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Dunbar Foundry Pig Iron.
Dunbar Connellsville Coke for Foundry Use.
American Sheet Iron Co.'s Sheet Iron.
American R. G., cleaned of uniform black color.
Dealers in all kinds of Iron and Steel Scrap

BRUCE & COO

TINNERS'
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TINNERS'
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186, 188 & 190 Water Street
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Ideal Sap Spo

Are made open or closed, and a full line of other Maple Sugar goods. Send for dealers' price list.

CHARLES MILLAR & SON CO , Utica,

HUB RANGES

HUB

If you want the best line ; the line with the most attractive and progressive selling features, look into the merits of the

Hub
Line of Ranges,
Steam and Water Heaters;
Hot Air and Combination Furnaces.

SMITH & ANTHONY CO., Boston.

It is assumed that "Half and Half" solder made of pure refined tin and lead is practically what should be used for all general purposes. We make that kind. No one can make it any better than we do, as we have had the experience of over 60 years.

Be honest to yourself in buying a solder honestly made, and which you yourself can confirm by analysis.

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MAKERS OF FINE SOLDERS

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Established 1810.

Your Future

business success can be measured by the wise or unwis choice of the goods you sell to-day. Hundreds of success ful stove merchants sell Glenwood Ranges and Heaters be cause they always satisfy and invariably make lasting friend

GLENWOOD

Write the Weir Stove Co., Taunton, Mass.

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Our Various Brands:

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Are made from strictly New Metals and the Proportions Guaranteed.

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Manufacturers of Tin Plate,

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PHILADELPHIA, PA., 115 North 7th Stre

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Index to Advertisements, Pages 64 - 66.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

LVII. ER 10. | NEW YORK AND CHICAGO, MARCH 8, 1902. | ONE DOLLAR A YEAR. SINGLE COPIES 5 CENTS.

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WALWORTH HEAVY PIPE VISE.



A first-class Tool for General Machine Work. Takes to 6-inch.

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The Gorton Side Feed Boilers

FOR STEAM AND HOT WATER HEATING.
INVESTIGATE FOR YOURSELF.
Send for Catalogue and Prices.

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AMERICAN STEAM and ALTITUDE **GAUGES,** POP SAFETY **VALVES.**

Heating Specialties. American Steam Gauge & Valve Mfg. Co., Bismark St., Boston, Mass., U. S. A.

We like to sell single ranges and furnaces, but we like better yet to sell them in bunches of six, a dozen or a hundred. Not long ago, we sent six of our Excelsior Double Oven Ranges to Mr. J. W Morrison of Holmesburg, Penna., and this is what he did with them:

"I placed six of the 806 Excelsior Portable Double Oven Ranges in the buildings known as the Annex to the Morelton Inn, at Torresdale, Penna. Every one of these ranges has given entire satisfaction."

That double oven Excelsior Range, by the way, seems to occupy a field of its own. It is uniquely good.

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NEW YORK PHILADELPHIA BALTIMORE

Ve are gathering in the

iness in galvanized

— no man knows

h like the tailor.

can Sheet Steel Company, New York.

Why not increase your trade over last season?

P. P. STEWART STOVES

will help you do it
Write for prices on the style in which you are most interested

FULLER & WARREN CO., Troy, N. Y.

his Ad. changes every week.

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GLOBE and ANGLE VALVES, IRON and BRASS.

All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.

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328-330-332 Second Ave.,
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Galvanized and Black Sheets.

The Leaders:
Follansbee Pure Iron Old Style; made specially, having Charcoal Iron Base.
Also, Scott's Extra Coated, well known everywhere.
Samples on application.

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F and ATOR VALVES, 1 TRAPS, M AND WATER CING VALVES, TEMPERATURE CONTROLLER and No. 1 DAMPER REGULATORS
NOISELESS BACK PRESSURE VALVES. PUMP GOVERNORS. STEAM and OIL SEP. ARATORS
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Jenkins Bros.' Valves

are manufactured of the best steam metal, and are fully guaranteed. Why experiment with cheap valves? If you want the ***BEST*** ask your dealer for valves manufactured by Jenkins Brothers. Remember all genuine are stamped with Trade Mark like cut.

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READ OUR "AD"
Page 16.
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STANDARD OF AMERICA

If there is no Agency for the Genuine Round Oak heating stove in your town, now is a good time to look it up.
It is the most successful heating stove ever made.
We have over 4000 customers who are selling it with profit and satisfaction.

We hope to hear from you
if your town is open.



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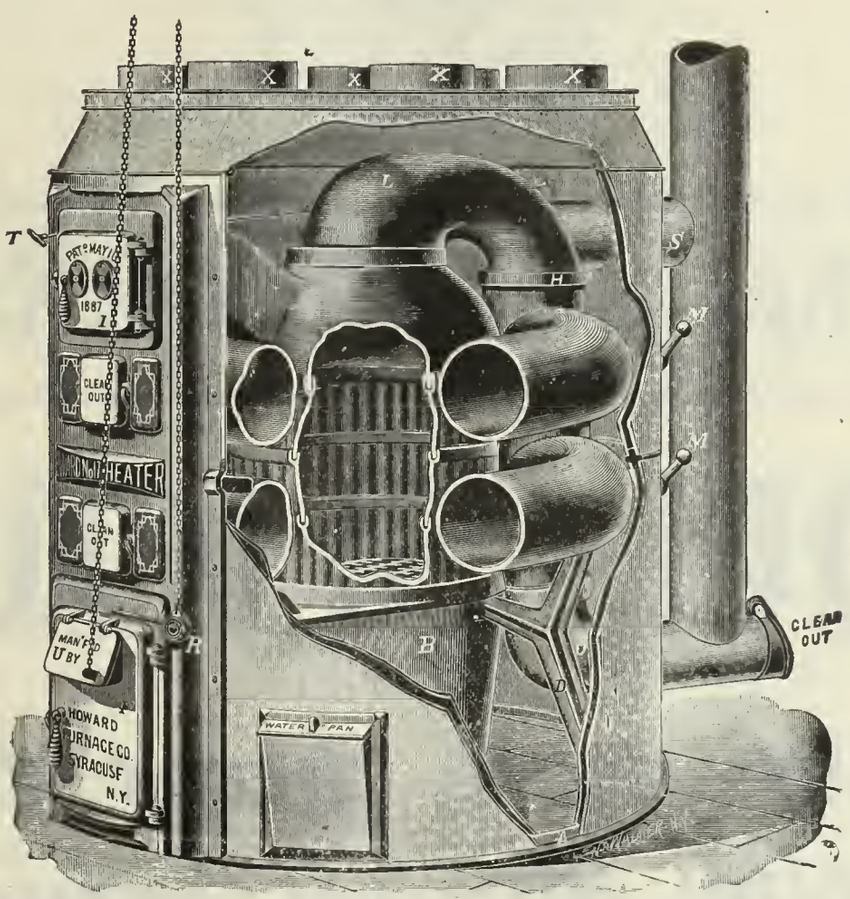
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HOWARD FURNACES

Very LOW DOWN,
Yet Large RADIATING SURFACE.

THERMAL
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COMFORT.



LONG FIRE TRAVEL AND ECONOMICAL.

Heat INCREASED.

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PARIS—GOLD MEDAL—1900.

INTERNATIONAL HEATER CO.,

LARGEST MAKERS OF HEATERS IN THE WORLD

UTICA, N. Y.

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AN 1840 CHICAGO STOVE AD

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Hardware, &c.

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WHOLESALE AND RETAIL DEALERS IN

STOVES,

Junietta, Swedes, and English Iron, Tin Plate, Sheet Iron and Copper, Hollow and Hardware, Cutlery, Nails, Spike, Sash, Glass, Blacksmiths', Carpenters' Joiners', and Coopers' Tools,

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They Sold "ACORNS"

YOU SHOULD

If you want the be
the money which ca

RATHBONE, SA

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Pacific Coast Distributers: = = = = =

1902

Sixty-Two Years Later



"THE OLDEST AMERICAN STOVE MAKERS"

SELL THEM

trade-mark line for
be purchased to-day

D & COMPANY

AURORA, ILLS., *Western Foundries.*

THE HARRY UNNA COMPANY, San Francisco.

MONARCH

EVAPORATING AND GENERATING GASOLENE STOVES.

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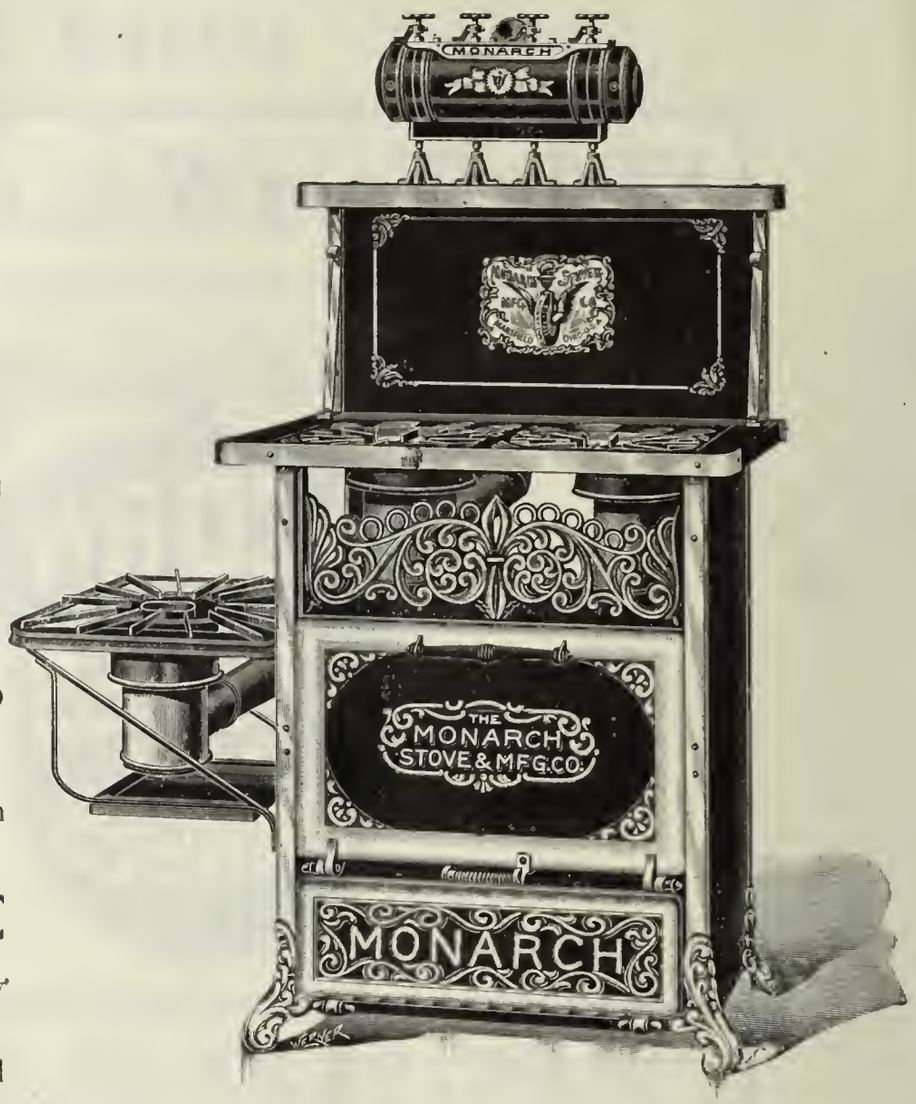
"Note the Difference."

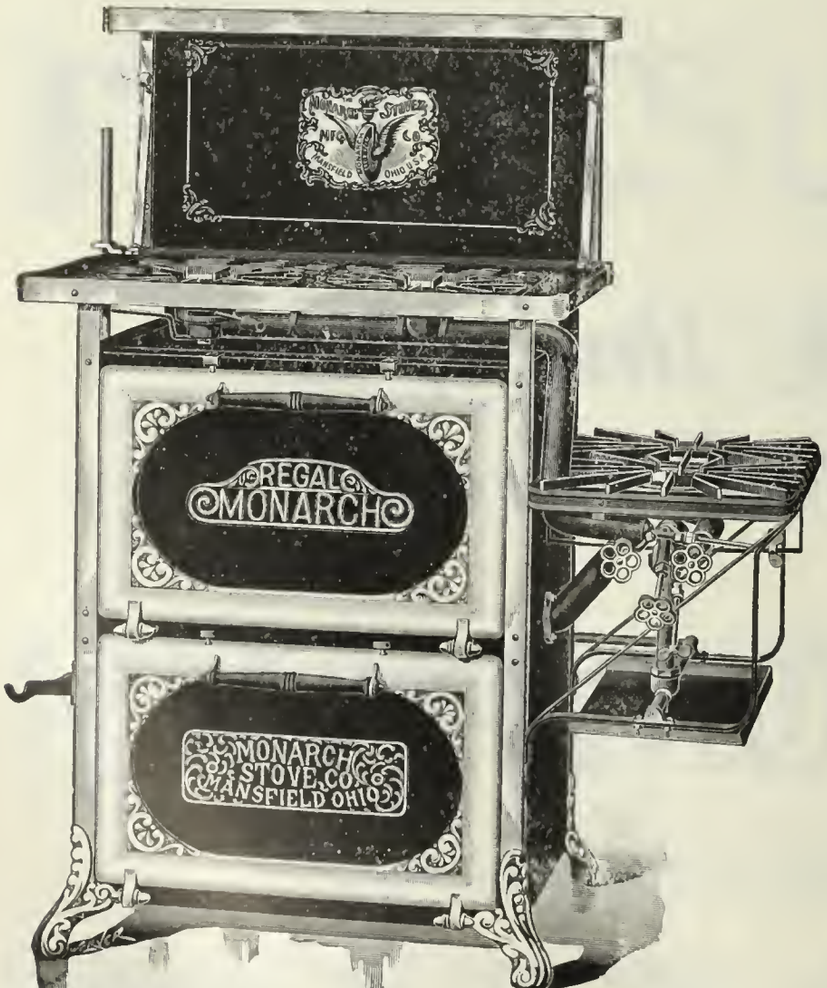
There is relatively just as much difference between the

MONARCH LINE

and other makes as between day and night.

Our line to-day is first and foremost in point of Excellence, Beauty, Finish and Practica bility.





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Make no error in handling this line of Vapor and Oil Stoves and Asbestos Lined Ovens, as they, once shown, practically sell themselves. Write to us direct or any of the agencies enumerated below.

The trade in the various States covered by these Branches and Representatives will be given the very best service possible and their interests receive the most careful attention.

Have you a copy of the Catalogue? If not, drop a postal to any of these agents and it will come on the jump.

The Monarch Stove & Mfg. Co.,

MANSFIELD, O.

BRANCHES.

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107 N. 2d St., Philadelphia. 191 Eagle St., St. Paul, Minn
203 Wood St., Pittsburg.

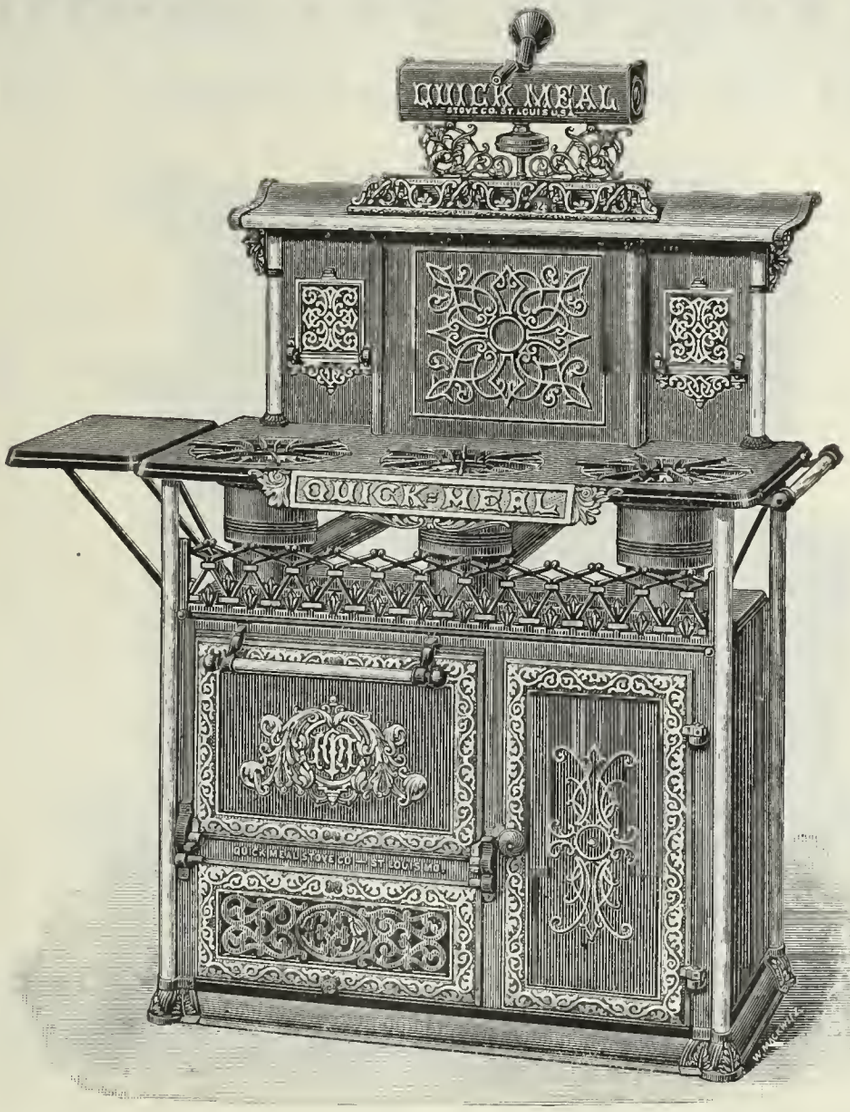
H. R. BRUCE & CO., Agents,

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Gasoline Stoves.



The Brass Float used in the tank of the "Quick Meal" Evaporating Stove regulates the pressure of the gasoline perfectly and insures a steady flow of gasoline at all times.

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The Sub Flame Burner used in the "Quick Meal" Evaporating Stove is now entering its twelfth season without a change, it success has been proven and it has been shown that the "Quick Meal" Burner, with this attachment, has been the only successful Evaporating Burner ever made.

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"Quick Meal" Evaporating Stoves are made so as to attract attention, please the eye and give satisfaction. They are the stoves to sell to your friends as they never fail. Catalogues now ready.

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YOU CAN DEPEND ON IT.

The Standard Wickless Blue Flame Oil Stove,

FOR COAL OIL OR GASOLINE.

The original and most successful Wickless Oil Stove.



That's what it is—The "Standard."—Standard in name, the Standard in quality, the Standard in perfect operation. Four years of continued success and it still leads. It's the Standard of excellence.

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FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.

PACIFIC COAST STATES.

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DOMINION OF CANADA.

THE THOS. DAVIDSON MFG. CO., · · Montreal, Quebec.

WESTERN JOBBERS.

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MORLEY BROS. - Saginaw, Mich,

TOWNLEY STOVE CO., Terre Haute, Ind.

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Reliable Vapor Stoves and Ranges for 1902.

DEALERS who are seeking a strictly high grade line of Vapor Stoves and Ranges that are standard the country over cannot afford to overlook our line. "**RELIABLE**" Stoves have the NAME and FAME as being the best and most successful to handle.



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Our line for 1902 is larger and finer than ever. Send for our latest catalogue. It is yours for the asking.

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The Schneider & Trenkamp Company,

CLEVELAND. CHICAGO. SAN FRANCISCO.

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CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS

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THE ONLY SAFE GASOLINE STOVE MADE.

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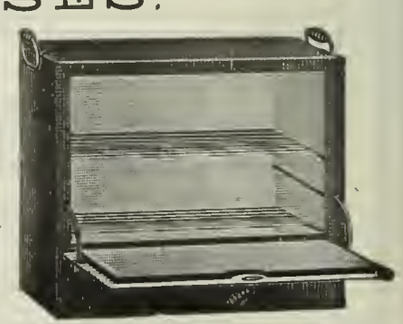
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Asbestos Lined Ranges and Ovens, Cookers and Hot Plates.

FOR ALL GASES.



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REPRESENT

The Best Materials,
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The Best Workmanship

THEY ARE

The American Standard for Excellence.

ALL STYLES AND SIZES AT MODERATE PRICES.

We would be pleased to send our catalogue.

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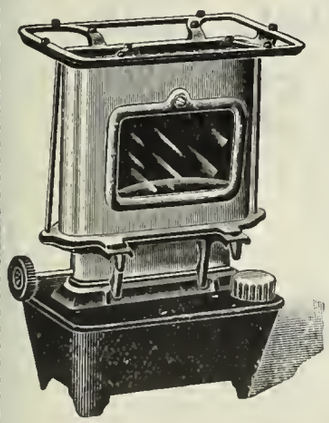
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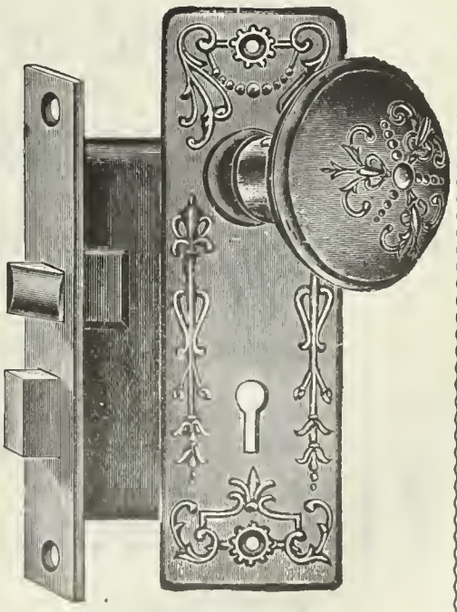
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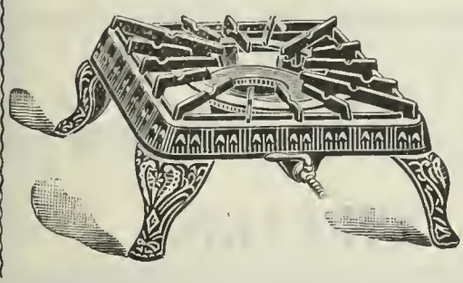
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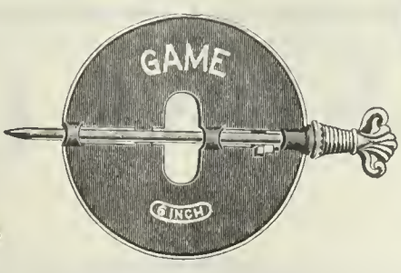


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CLEVELAND, O.







"GOOD SPECIALTIES ARE MONEY MAKERS."

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Highest Grade of Finish. Prices Reasonable.

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Moore's STOVES & RANGES



The Key to Convenience *and one of the* Distinctive Features *of*

MOORE'S RANGES

is the Swinging Key Plate

It is **easily** *raised by a simple chain and pully attachment, and when in place affords splendid opportunity for* **feeding** *or* **laying the fire,** *and for* **broiling or toasting.**

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36

THE

GEM-MILLER STEEL-PLATE RANGE



Which we introduce as a High-Grade, Medium-Priced Cooking Apparatus is made only by

The Wm. Miller Range & Furnace Co.

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Write for Catalogue and Prices.



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THIS IS THE LINE YOU OUGHT TO TIE TO.

NOTHING LIKE IT.

Acknowledged by leading Dealers to be the **best built and handsomest Steel Range on the market; White Enameled inside and out Portable Reservoir fits the four sizes of American Range.**

BACK FLUE MADE OF HEAVY CAST IRON.

M & D HOTEL RANGES.
M & D DOUBLE OVEN RANGES.
M & D FAMILY RANGES.
M & D COMBINATION RANGES
M & D GAS RANGES.
M & D CHARCOAL BROILERS.
M & D STEEL LAUNDRY STOVES.

We build the LARGEST LINE OF STEEL RANGES in the WORLD.

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WESTFIELD, MASS., U.S.A.

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Heating Contractors, Engineers and Architects

92 Pages. Size 9 x 12 Inches.

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STEAM BOILERS (8 SIZES), 550 SQ. FT. RADIATION SUPPLIED.
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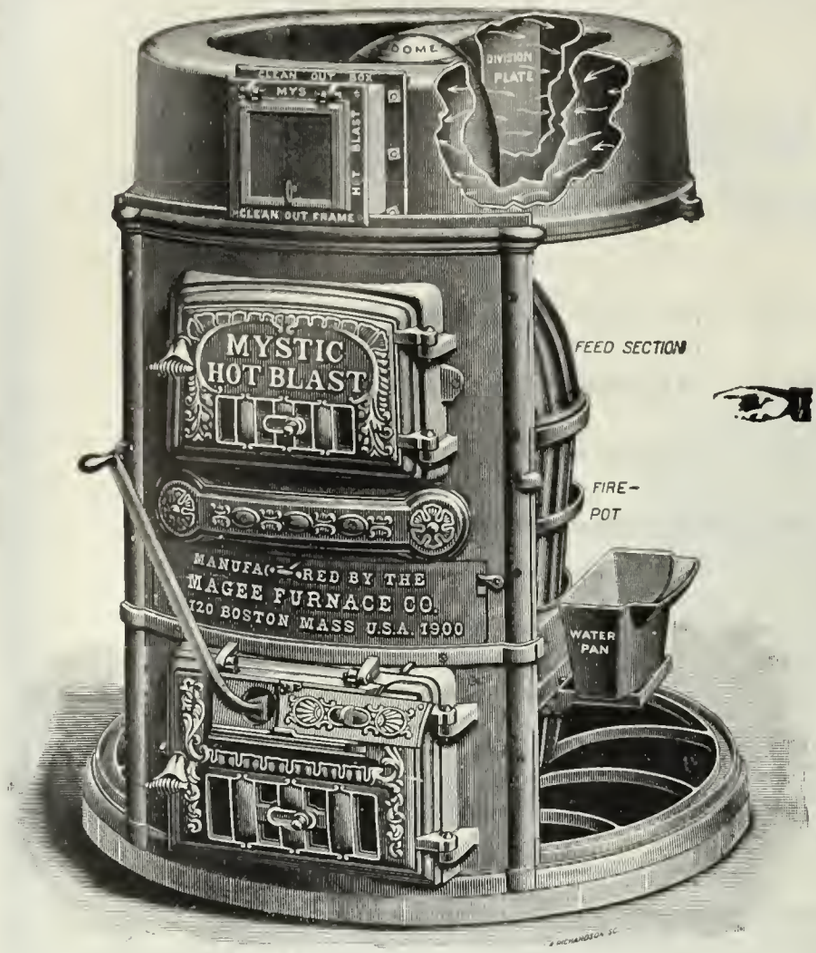
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510 ARCH STREET,
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MAGEE MYSTIC HOT-BLAST FURNACE



Where's the Man or Woman who has never heard of

Magee HEATERS ?

Cut shows one of our ***ALL CAST HEATERS*** for warm air They're made to last. Gas and Dust Tight. Fire Pot, heavy and durable, connected by cup-joints in the center. Dock-Ash Revolving Grate. Durable in construction and heat-resisting qualities. Thorough combustion of the coal is positive

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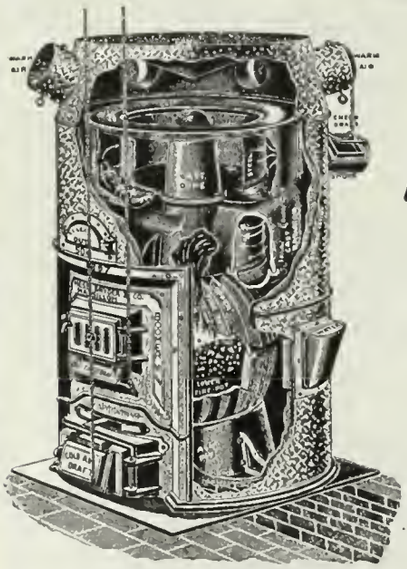
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Boomer Furnaces.

OR

Boomer Steel Ranges

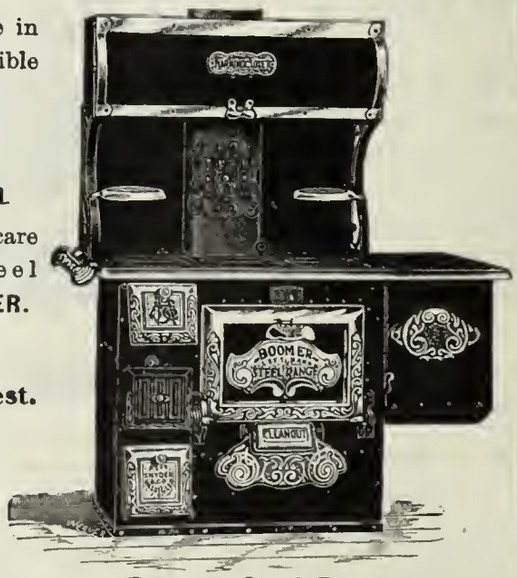


Boomer Furnace.

We want to state in strongest terms possible that if you want the

HEAVIEST,
MOST DURABLE,
MOST ECONOMICAL

and easiest to take care of Furnace or Steel Range, buy a **BOOMER.**



Boomer Steel Range.

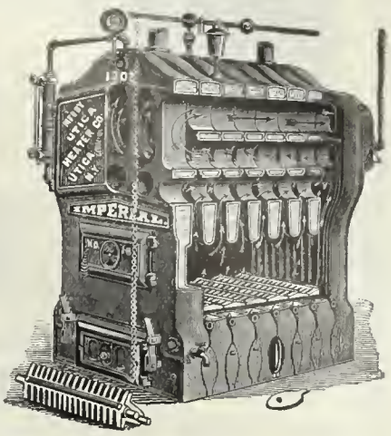
Neither time nor money is spared to make them the Best.
Buy Boomers and save your coal bills.
We invite investigation.

THE HESS-SNYDER CO.,

Manufacturers, MASSILLON, O.



SUPERIOR Steel Furnaces.
SUPERIOR Heaters.
UTICA Heaters.
IMPERIAL Sectional Boilers.
IMPERIAL Round Boilers.
AUBURN Round Boilers.
Double Safety Furnace Pipe.
Heating Contractors' Supplies.



We are offering special inducements to dealers unacquainted with our lines, and it will be to your best interests to ask for our catalogue and prices

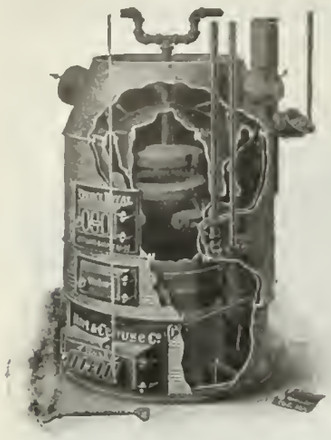
Our Furnace Catalogue illustrates and describes our complete line of Hot Air Furnaces---*11 DIFFERENT STYLES, 48 DIFFERENT SIZES*---for any kind of fuel, for any climate and for all possible requirements.

We also manufacture round and sectional boilers for steam and hot water heating. If you are in the market for goods in this line, ask us for circulars and quotations.

REMEMBER, we are not connected with any Trust, Combination or Association, and will quote you independent prices upon application.

We have something interesting to you. Write for it.

UTICA HEATER COMPANY, Utica, N. Y.





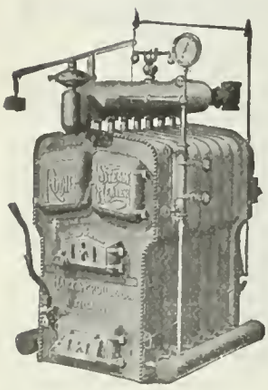
Royal Heaters.

HART & CROUSE CO.,

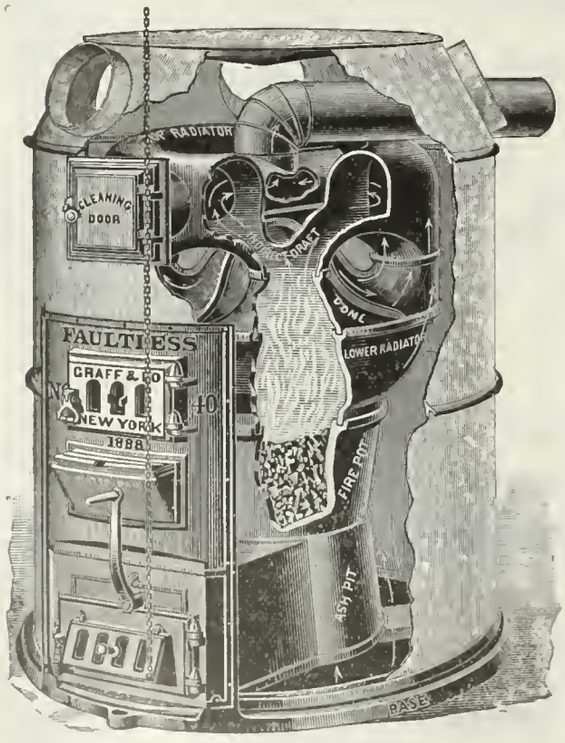
235 Water St., New York. | 78 Lafayette St., UTICA, N. Y. | 79 Lake St., Chicago.

The Leading Line of Heating Apparatus.

HOT WATER,
STEAM,
HOT AIR.



We Do Not Claim Everything



FAULTLESS.

But all that we DO claim is based on HARD FACTS!

SOME OF OUR CLAIMS.

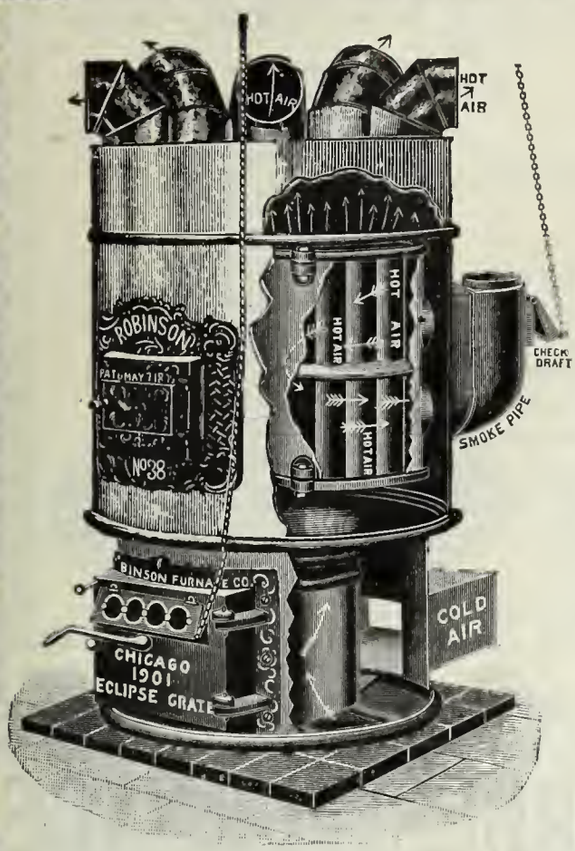
We make **WARM AIR FURNACES** in **GREAT VARIETY**, adapted to **all sections,** and to meet all **reasonable** price requirements. **OUR FURNACES** are as **substantial,** as **powerful,** as **economical** and as generally **satisfactory** as any others in the market.

PARTICULARS GLADLY FURNISHED.

The GRAFF FURNACE CO.

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208 WATER ST., NEW YORK.



The Robinson Tubular Furnaces

Are constructed to give the greatest amount of heat from the smallest amount of fuel. These Furnaces contain many special features not found in other heaters. These features are original with us and are fully protected by letters patent.

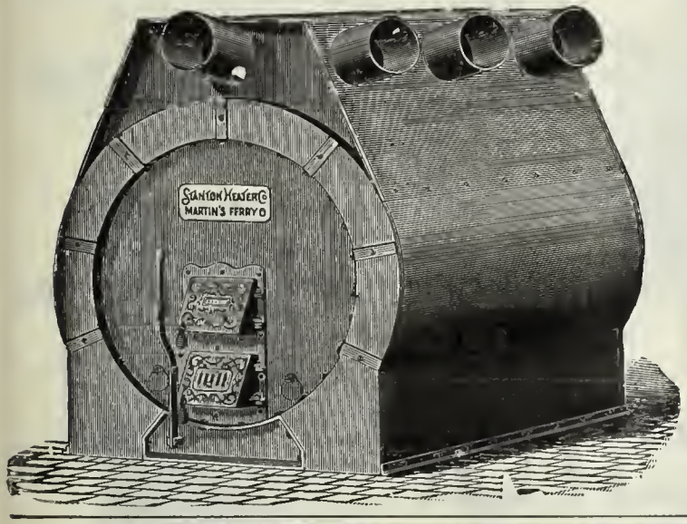
WRITE FOR CATALOGUE.



ROBINSON FURNACE CO.,

Chicago, Ill,

The Stanton Seamless Heater,



PORTABLE CASED.

The cut herewith represents the ***Stanton Seamless Heater complete,*** with portable casing. The inside Casing Sheet is made of ***No. 24 cold rolled sheet steel.*** The outside casing is made of ***No. 24 Aluminum-coated sheet steel,*** which is anti-rust and will stand a much higher degree of heat than it will ever be subjected to before tarnishing. Heavy asbestos paper is placed between inside and outside casing, which prevents heat from radiating into cellar. ***This coating will not peel off,*** but remain pretty and white.

SEND FOR CATALOGUE.

THE STANTON HEATER CO.,

Martin's Ferry, Ohio.

See Our Advertisement Next Week.



IF YOU ARE NOT SELLING THE

Peck-Williamson Underfeed Furnace

you have not the trade and are not making the money you might. Just a pull or two of the lever feeds the new coal from underneath.

The Underfeed Furnace consumes less fuel than any other furnace ever built. The coal is burnt more slowly. All the heat units from it, as well as from the smoke, are utilized and all smoke eliminated.

Our handsome booklet explains its splendid heating qualities and coal saving.

You may have this booklet and our special plans for selling. Ask for booklet about our Laundry Dryer also.

THE PECK-WILLIAMSON COMPANY,

CINCINNATI, OHIO.



W. A. Staples,
Contractor and Builder,
P. O. Box 386.

Mansfield, Mass., January 31st, 1902.

Dighton Furnace Co.,
Taunton, Mass.

Dear Sirs:

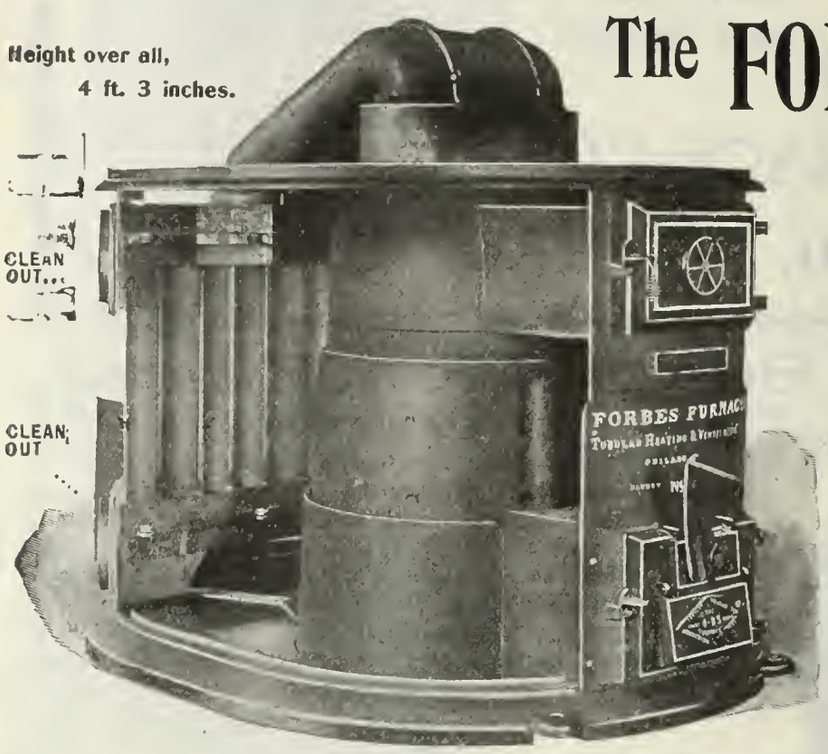
The "DIGHTON" Furnace placed in my house last July has been very satisfactory.

I have Registers in the parlor, dining room and front hall on first floor and chamber and bath room on second floor and the other rooms on the second floor are comfortably warmed when the doors are opened.

I have only burned **one ton of coal** in the last forty days.

Please advise your agent to take measurements for another house, **at once**, as I am about ready for the partition pipes.

Yours truly,
W. A. Staples.



The FORBES FURNACE.

You run no risk in putting in the

Forbes Furnace.

When properly installed we guarantee them in every case.

They are constructed entirely of cast iron.

No sheet iron drums.

Our radiating tubes are ⅛ in. thick, and will wear for years.

Specially suited for low cellars.

SEND FOR CATALOGUE AND FULL PARTICULARS.

Tubular Heating & Ventilating Co.,
228 Quarry St., Philadelphia, Pa.



WINCHESTER

Like a spouse, a steam fitter takes a heater "for better or for worse." Ten to one, if he takes a "WINCHESTER" it's for better, not for worse. It's a good heater to tie to. Smith & Thayer Company, Boston, Mass., 106 Beekman St., New York.

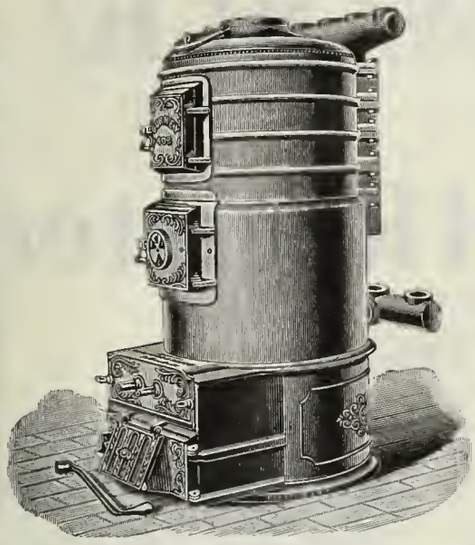


HEATER.

BRAND STOVE CO.

STOVES, RANGES and FURNACES.
SEND FOR CATALOG.
MILWAUKEE, WIS.

Both quality and price argue all the time in behalf of



"GURNEY" HEATERS.

Hot Water or Steam.

They are constructed along the most approved lines, have well proportioned grate areas, made of the best quality of iron by skilled workmen, and will be found thoroughly reliable in operation.

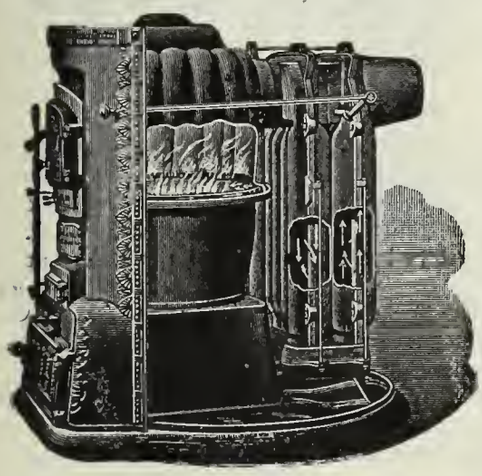
Capacities fully guaranteed.

Send for latest trade catalogue.

GURNEY HEATER MFG. CO.,

74 Franklin St., Boston. 111 Fifth Ave., New York City

Western Selling Agents, James B. Clow & Sons, 222-224 Lake St., Chicago, Ill.



Bengal Furnaces

ARE TRADE WINNERS.

Most powerful and compact furnace ever produced.—Over 3500 square inches radiating surface.—More than any other furnace their size.

ALL CAST IRON.

YOU NEED THEM IN YOUR BUSINESS.

Secure a BENGAL AGENCY at once.

WRITE US FOR CATALOGUE AND PARTICULARS.

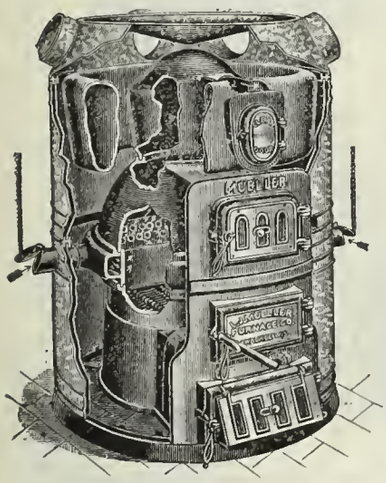
EASTERN SELLING AGENTS:

GURNEY & CO.,

Washington, Hanover and Elm Streets, Boston, Mass.

FLOYD, WELLS & CO., Royersford, Pa.

WITH AIR BLAST ATTACHMENT.



Is Your Heating Business Profitable?

IF NOT

MUELLER

Furnaces and Boilers

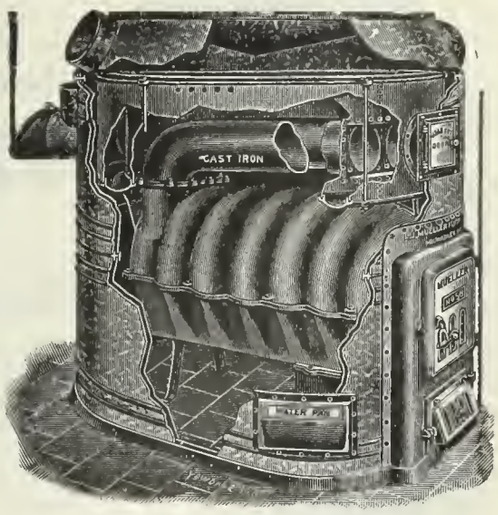
WILL MAKE IT SO.

COMPLETE LINE OF HEATERS, FOR ALL KINDS OF FUEL.

Get Our Special Register Offer.

EVERYTHING IN THE HEATING LINE.

FOR WOOD.



L. J. MUELLER FURNACE CO., 190 Reed St., Milwaukee, Wis.

REFRIGERATORS,
BLUE FLAME OIL STOVES,
GASOLINE STOVES.

LARGEST JOBBERS
in
NEW ENGLAND.

GAS RANGES,
FURNACES, STOVES,
RANGES AND REPAIRS.

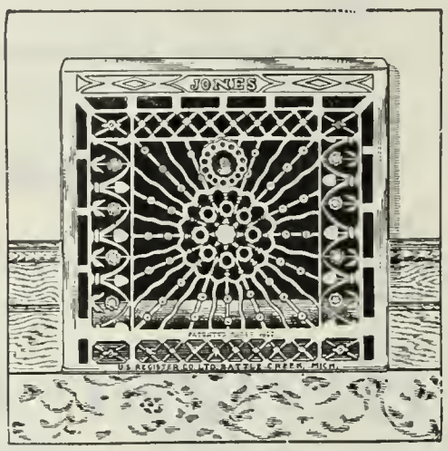
HENRY N. CLARK CO., 56 and 58 UNION ST., Boston, Mass.

FURNACE WORK

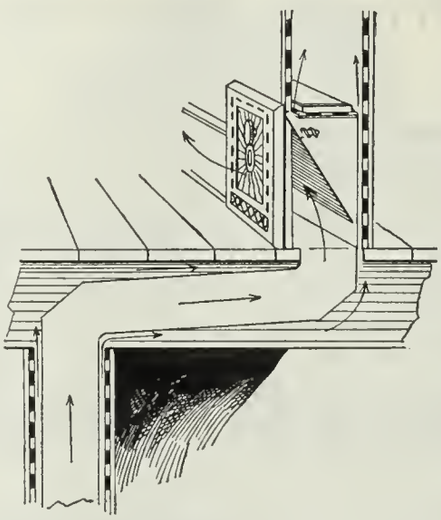
Is simplified by the use of

The Jones Side Wall Register

Each Register is also a
REGISTER BORDER,
REGISTER BOX,
DEFLECTOR and
FOOT WARMER,
and avoids Cutting Carpets and Floors.



They are
NOISELESS,
FIREPROOF,
PRACTICAL,
and have increased capacity equal or greater than floor registers.

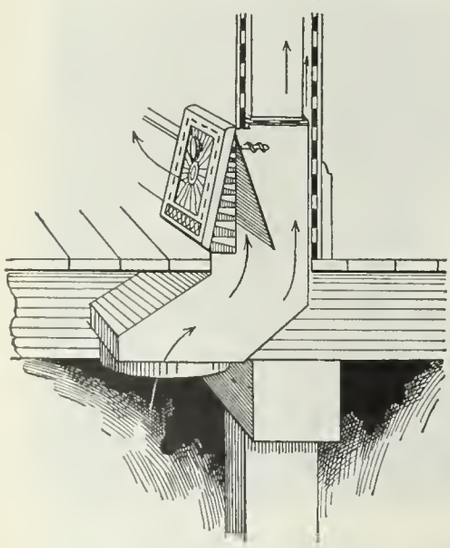


Showing a No. 15 Jones Register with wall pipe connected to second floor; also showing a No. 12 Second Floor Register and manner of connecting foot piece or boot in cellar.

They are made to be placed in the wall, utilizing the space from the lath on one side to the shoe moulding on the other, where one room is to be heated, and project into the room one and one-half inches at the floor line where two rooms (one on the first floor and one on the second floor) are to be heated from one large basement pipe.

The accompanying illustration shows the manner in which the wall pipe is connected, it resting on a cast-iron collar at the top of the register. This collar is flanged and has lugs cast thereon, which separates the inner and outer casing of the register box, and leaves openings at the top of the double box which permits the air to pass into the space around the wall pipe and upward to the attic and ventilating chimney.

It will be observed that cellar air is not used for protection, neither is cellar air, coal dust, etc., discharged into the sleeping rooms above, as is done with some side wall registers and all common registers where safety pipe is used.

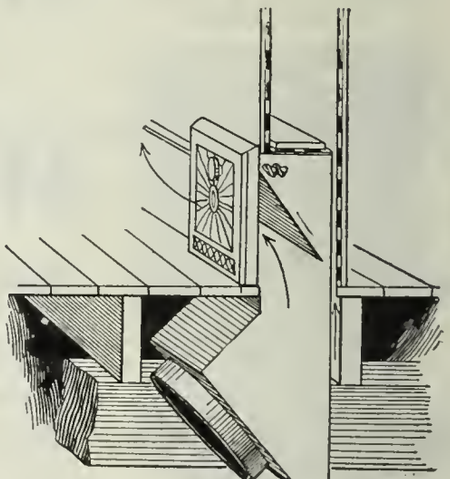


Remember, the Register Box is included with the Register and is ready to install when received.

Double Headers.

We make double headers where two rooms on the first floor or where two rooms on the second floor are to be heated from one pipe.

The double headers have a deflector on each side, which prevents soiling the walls.



No. 13 or No. 14 Register for First Floor.

Write for Testimonials, Prices and Descriptive Circular.

MANUFACTURED BY

The United States Register Company, Limited,

61 State Street, East, BATTLE CREEK, MICH.

Your Guarantee is Good,

If backed up by our line. We make many kinds and sizes of steam and hot water boilers, and you as a dealer ought to know all about this line. Let us send you our printed matter and post you on the standard line. Write to-day.

KEWANEE BOILER COMPANY

KEWANEE, ILLS.



Emperor Furnaces

FOR WOOD.

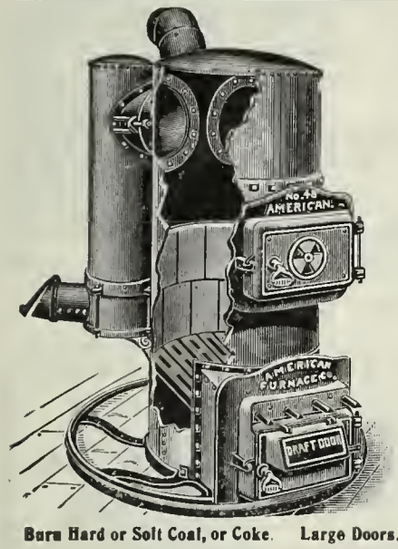
Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces. . . .
Furnished for either Brick or Galvanized Iron Casing

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Bergstrom Bros Co.

NEENAH, WIS.



Burn Hard or Soft Coal, or Coke. Large Doors.

About Fire Pots.

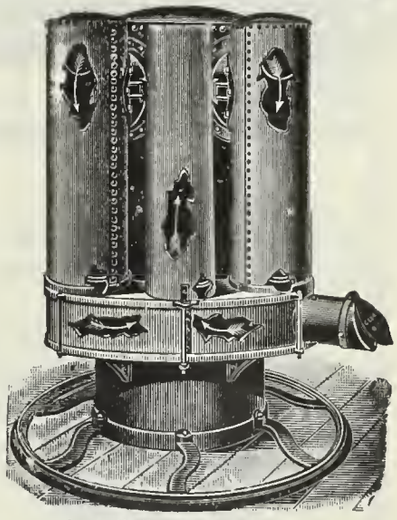
We formerly lined our fire pots with cast iron—then they cracked and warped. Now we use fire brick for lining and will guarantee it for five years. The lining is replaced through the fire door.

The **AMERICAN FURNACE** is made strong in places where other furnaces have proven weak; it is made of heavy steel and riveted tight like a boiler. Will burn any kind of fuel.

You can only build up a permanent furnace business by handling a first-class furnace. We manufacture for the better class of trade.

The American Furnace Co.,

1911-13 PINE STREET, · ST. LOUIS, MO.



Large Radiators, easy to clean out.

Write for prices and secure the agency before the other fellow gets it.



Common Sense Circulator AND Radiator.

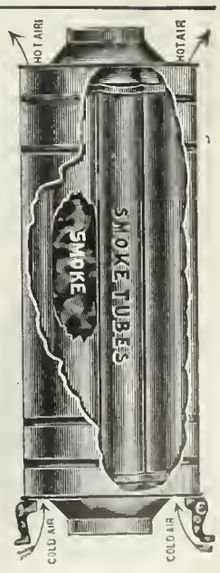
A FUEL SAVER.

This heater is so simple that its superiority over all others is plain. Being open at each end, the cold air is taken in at the bottom, passing out heated at the top, producing a constant circulation unequaled by any radiator, is easily cleaned out and if necessary can be repaired by any tinner. Takes the place of a joint of pipe 6 or 7 inch, outer casing 10 and 12 inches in diameter. Made of Wood's Refined and American Russia Iron. Can be used on pipe in back of stove, or room above, with any kind of fuel. It is the best heater made. Patronage of Stove and Hardware Jobbers solicited. If the house you buy of cannot supply you send direct to me. I am not looking for Department Store or Mail Order trade. Patent applied for.

Manufactured by

A. C. SELLECK,

755 to 757 W. Madison St., - - - CHICAGO, ILLS.



HOT WATER AND HOT AIR



HEATING BY COMBINATION STOVES AND FURNACES.

Suitable for Large or Small Houses, Stores, Conservatories, Barber Shops, Hotels, etc., etc.

Heat Water Quickly.
Circulation is Positive.
No Joints Inside to Leak.

THE NATIONAL PIPE BENDING CO
160 RIVER ST., NEW HAVEN, CONN.

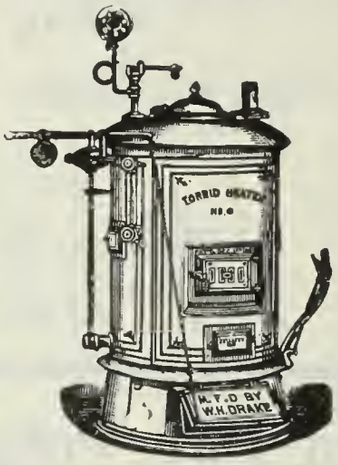
STAMFORD FOUNDRY COMPANY

MAKERS OF

RANGES COOKING AND HEATING STOVES
HOT-AIR AND COMBINATION AIR AND
WATER FURNACES
LAUNDRY STOVES CONFECTIONERS' STOVES
CABOOSE RANGES ETC ETC

STAMFORD CONN

"TORRID HEATER."
FOR STEAM OR HOT WATER.



It is Practical in Design.
It is Safe, Being Tested to 200 Pounds.
It is Easy to Manage and Keep Clean.
It is Durable.
It is Sectional and Easily Handled.
It has No Packed Joints.
It is Self-Feed or Surface Burning.
It has the Torrid Patent Rocking and Dumping Grate.
It is Low in Price.

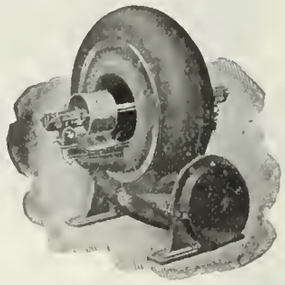
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MANUFACTURED BY

W. H. DRAKE, No. 36 Clinton St., NEWARK, N. J.

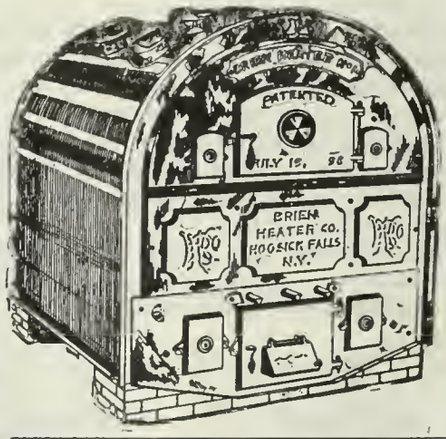
Factory: Hackettstown, N. J.

The "A B C" Volume Blowers and Exhausters.



Scientific in design. Construction and efficiency guaranteed.

American Blower Co.,
Detroit, Mich.
New York. Chicago. London.



Brien Heater.

A perfect, all cast WOOD or COAL burner. There is no other Hot Air Furnace as low down as the "BRIEN."

Write for territory, catalog and prices.

BRIEN HEATER CO.,
HOOSICK FALLS, N. Y.

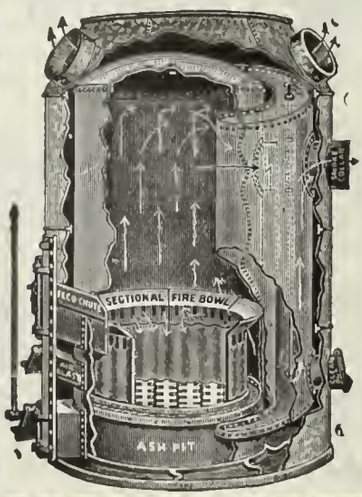
THE S. & S. PATENT
Stove Pipe Thimble



Locks the Pipe from Pulling Out, and from Pushing In and Closing the Draught. Will last a lifetime. Nothing to wear out, and costs but a trifle. *Send for sample* and prices.

City Forge and Iron Works,
DAYTON, OHIO.

The Torrid Zone Furnace



is a trade winner because it has points of merit peculiar to itself that can be found in no other steel furnace. Our new catalogue is now ready to mail and a description of our Hot Air and Hot Water Combination Furnace can be seen in it. We furnish either the cast iron lining or the fire brick at the same price. Our Wood Furnace is called a powerful heater by those who use it.

CATALOGUE FREE.

Lennox Manufacturing Company,
Eighth Ave. and Frederick St.,
MARSHALLTOWN, IOWA.



Vance Boilers.

The most economical Steam and Hot Water Boiler on the market. Write for Catalogue and Price List.

VANCE BOILER WORKS,

373 Atkinson St., Geneva, N. Y.



CABINET.

PORTABLE OVEN.

OUR LATEST PRODUCTION.

BAKES EVENLY BY THE CIRCULATION OF HOT AIR.

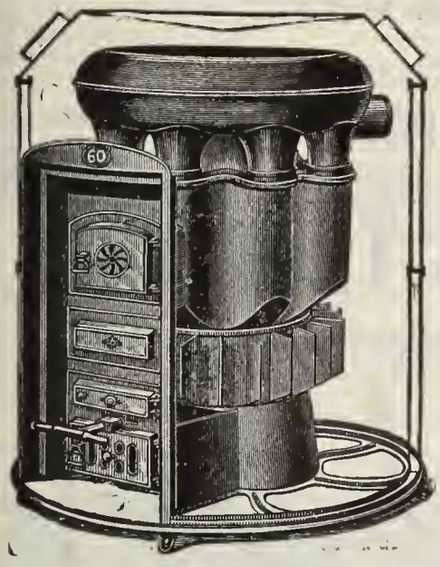
FOR BAKERS, CONFECTIONERS, HOTELS,

Also the best oven for Core Baking, Japanning, Enamelling, etc.

Made in six sizes, single and double, for coal, wood, natural or artificial gas.

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The G. S. BLODGETT CO., Burlington, Vt., U. S. A.



Imitation is Flattery.

Cory's All Cast FURNACES

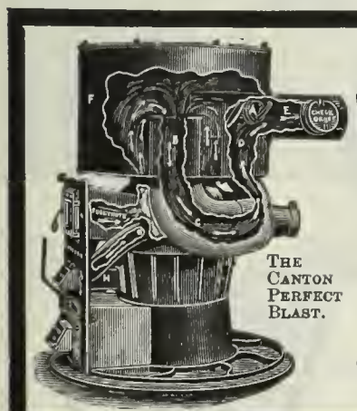
HAVE BEEN COPIED BUT NEVER EXCELLED.

An Absolutely Gas Tight Furnace Without Bolted Joints.

UZAL CORY & CO.

210 WATER ST., NEW YORK.

Established 1847.



CANTON PERFECT BLAST AND OAK

WARM AIR FURNACES

Heavy Castings, Tubular Radiator, Large Secondary Radiator, A Perfect Blast,

ALL INSIDE THE CASING.

THE BONNOT COMPANY, Canton, O.

THE CANTON PERFECT BLAST.

20th Century Gas Stoves

THE BEST GAS STOVE MADE.

Best Materials and Workmanship. Prices Low. Mail Orders Promptly Filled.

STOVE REPAIRS IN STOCK FOR 2,000 STOVES AND RANGES.

Write for Prices.

THE METROPOLIS SHEET METALS AND STOVE REPAIRING CO.,

261-261½ Springfield Ave., Newark, N. J.

Pierce

BOILERS and RADIATORS

for Steam and Water Heating.



Pierce Touraine Steam Boiler.

LARGE HEATING CAPACITY.
ECONOMIC IN FUEL CONSUMPTION.

Endorsed by the foremost Architects and Heating Engineers.

Write for New Illustrated Catalogue.

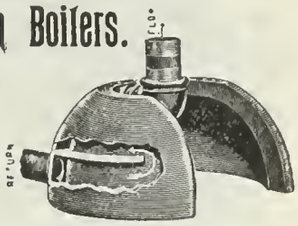
Pierce, Butler & Pierce Mfg. Co.,

Syracuse, N. Y.

New York. Boston. Philadelphia.

The Champion Hot Water Combination Boilers.

They Fit Any Furnace.



Base section when used without ring sections.



Ring Section.

These Boilers are made in three sizes diameter, and from 100 to 600 square feet radiation capacity.
Will heat those cold rooms, or an addition to the building. Will increase the capacity of any furnace. Are cheaper than coils and will do more work.
Write for new circular. Manufactured by

FRANK D. STOLZ,

115 Lake St., Chicago, Ill.

It Isn't Every Day that You Can Buy Registers as Cheap as Now :: :: ::

Investigate Our Prices.

INDEPENDENT REGISTER CO.,

152 Champlain St., CLEVELAND, O.

STOVE BANDS
—AND—
RINGS.

SPECIAL TUBING.
Cut to Length and Plated.
FLAT STRIPS & CORNERS.
SPECIAL
PUNCH PRESSWORK
SOLICITED.
Quality and Finish the Best.
The Kirk Manufacturing Co.,
TOLEDO, - - - OHIO.

PATTERNS
FOR STOVES AND HEATERS.
First-class in wood and iron.
Vedder Pattern Works, - Troy, N. Y.

THE GEORGE W. COPE
Stove Pattern Works.
ORIGINAL, ARTISTIC AND PRACTICAL CONSTRUCTION.
Cor. Randolph and Atwater Sts.,
DETROIT, : : MICH.

The Milwaukee Pattern Works.
Ornamental and Stove Patterns.
Sketches and Designs for Stove Work of all kinds.
Correspondence Solicited.
505-507 Cedar Street, MILWAUKEE, WIS.

SCRANTON CORUNDUM & EMERY WHEEL CO.
1311-1315 Capouse Avenue, SCRANTON, PA.
Write for Catalogue.
OUR "BLACK DIAMOND" artificial abrasive wheels are especially adapted for **The Stove Trade**
THEY ARE THE BEST.

SELECTED
MICA
. . . ONLY . . .
Prepared expressly for the Stove and Hardware Trade.
Two Grades: "North Carolina" and "Nevada."
PRICE LISTS AND DISCOUNTS SENT ON APPLICATION.
THE PALERMO MICA CO.
115 Beekman St., New York.

MICA
Specially Prepared for the Stove Trade.
OHIO MICA CO., CANTON, OHIO.

AN OBEDIENT CHILD MINDS NO BETTER THAN A
RICHMOND
HEATER.
IT ALMOST TAKES CARE OF ITSELF.
IT HEATS YOUR HOUSE FROM CELLAR TO GARRET WITH LITTLE FUEL.
Write for Catalogue.
Richmond Stove Co., Norwich, Conn.



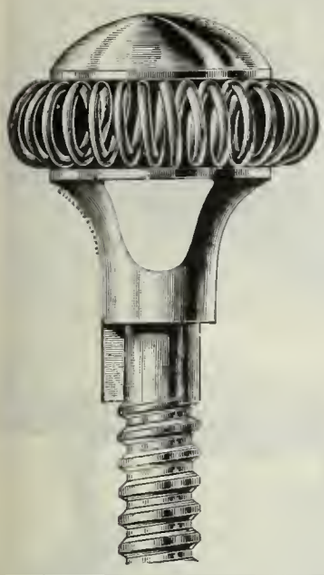
MONCRIEF FURNACES.
PORTABLE AND BRICK SET.
Unequaled in the Great Essentials, Simplicity, Durability, Economy, Capacity, Comfort.
NO BETTER MADE.
WRITE FOR CATALOGUE.. SPECIAL PRICE TO THE TRADE. MANUFACTURED BY
The MONCRIEF FURNACE & FOUNDRY COMPANY, Atlanta, Ga.

ARCTIC STOVE TRIMMINGS.



FANNER MFG. CO., - CLEVELAND, O.

MICA
EUGENE MUNSELL & CO.
MINERS & IMPORTERS
NEW YORK. 218 WATER ST.
CHICAGO 117 & 119 LAKE ST.



No. 346 Draft Register.

No. 520 ZERO Screw Knob.

MANUFACTURED BY

W. H. SHIELDS & CO.,

Successors to W. F. GREENE.

TROY, - - N. Y.



MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

RANGE, STOVE AND HEATER REPAIRS

AND FIRE-BRICK LININGS,

74 Beekman Street, New York,

FOUNDRY, Perth Amboy, N. J.

FIRE-BRICK FACTORY 36 to 46 South Fourth Street, Brooklyn, L. I.

BRANCH STORES:

South Fourth Street, Brooklyn, L. I. 362 Grove Street, Jersy City, N. J.

CATALOGUES NOW READY.

FIRE BRICK LININGS

For all Stoves, Ranges and Heaters.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.

M. D. VALENTINE & BRO.

FIRE BRICK

WOODBRIDGE, N. J.

Fire Brick Linings

—FOR—

Stoves, Ranges, Furnaces.

Eagle Stove Clay.

Incandescent Gas Fuel.

CUPOLA LININGS

For Iron and Brass Foundries.

WILLIAMS STOVE LINING CO.,

TAUNTON, MASS.

SHINES FOR ALL

It is the polishers' friend, and will polish anything. Write for free sample to 297 E. Washington St., Ind'p'l's, Ind.



GEO. W. HOFFMAN.



DO you want Stoves and Heaters that are easily sold and *STAY SOLD?* We have been very successful in designing patterns for such.

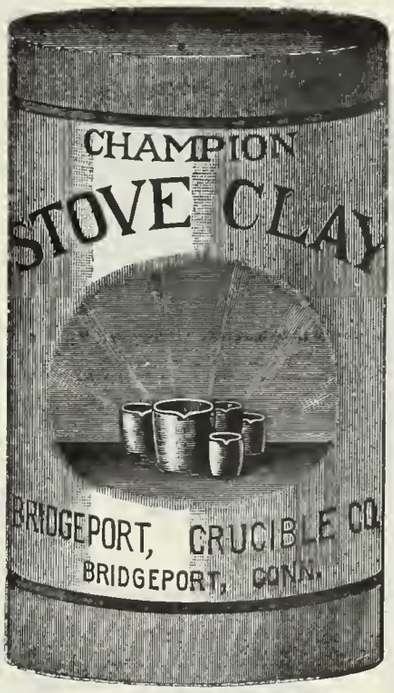
THE GOBEILLE PATTERN CO.,

CLEVELAND, OHIO

HANDLE THE BEST.

CHAMPION STOVE CLAY

Is the only brand made of crucible materials, viz.: Imported German Fire Clay and Plumbago from Ceylon.



Dealers are invited to send for circulars.

Packed in neat, attractive, round pasteboard boxes of three sizes: large, medium and small, holding about 10 lbs., 6 lbs. and 2½ lbs., respectively.

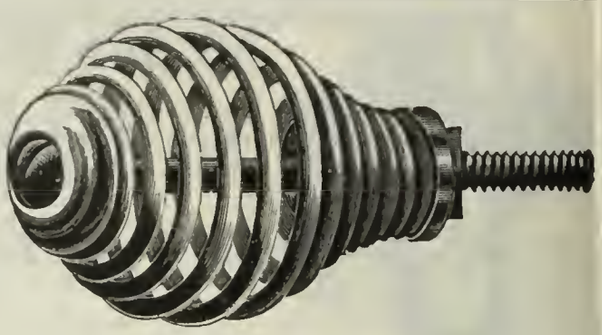
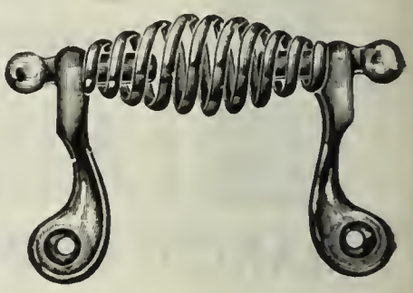
ALSO SOLD IN BULK.

Your jobber can furnish the goods.

BRIDGEPORT CRUCIBLE CO.

Bridgeport, Conn.



TROY NICKEL WORKS,

ALBANY, - NEW YORK.

ESTABLISHED 1880.

All The Latest Novelties in Stove Trimmings.

ALWAYS COLD.

If you want your stoves up-to-date you must use
Alaska Stove Trimmings.

SEND FOR CATALOGUE.

The Merchant



Who sells cheap goods at cheap prices cannot expect to enjoy his share of the general prosperity of the country.

Standard goods at moderate prices is the correct motto.



RUTLAND FIRE CLAY CO.,

60 Wabash Ave.,
CHICAGO, ILL.

NORTH EAST, MD.

Rutland, Vt.



"O.H." ONE PIECE STOVE PIPE Elbows

Perfectly round and true to size. With long ends, DOUBLE LOCK SEAM in throat or under side of Elbow.

HANDSOMEST, HEAVIEST AND STRONGEST STOVE PIPE ELBOW MANUFACTURED.

—SOLE MANUFACTURERS,—

THE LAWRENCE-LETTS ELBOW CO., Ltd., - - Waverly, N. Y.

STOVE REPAIRS.

BUY OUR STOVE REPAIRS and RECEIVE FREE A 1000-MILE BOOK ON ANY RAILROAD
Write us for full particulars.

CHAS. C. HEATH & CO., Philadelphia and Baltimore.

NICKEL PLATING OUTFITS.

ZUCKER & LEVETT & LOEB CO.
526 TO 530 WEST 25TH ST
NEW YORK, U. S. A.

SEND FOR CATALOGUE OF
NICKEL & ELECTRO-PLATING
SUPPLIES & POLISHING MATERIALS.

Perfect Elbows

PATENTED.



You should have the Perfect Elbows in stock for your "particular" customers. These Elbows are neater and handsomer than any others and give a finished appearance to a stove pipe that an ordinary Elbow does not.

All Sizes, 3 to 8 inches.

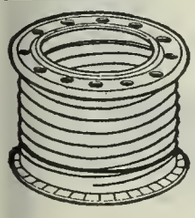
Common One Pass, Refined Blue, Planished and Galvanized.

We are booking orders for shipment any time this year.

Write our house nearest you.

SIDNEY SHEPARD & CO.,

Buffalo, New York City, Chicago, Kansas City, St. Louis, Denver, Seattle. San Francisco



O. K. STOVE PIPE THIMBLE

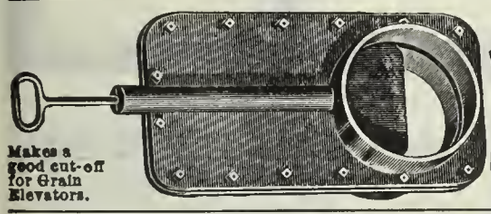
FOR PARTITIONS AND CEILINGS.

Can easily be adjusted to any thickness of wall, and when screwed up tight against plaster will not work loose and allow the plaster to crumble and fall.

It is perfectly fire-proof, low in price, and never fails to interest customers.

O. K. MANUFACTURING CO.,
Division St., Buffalo, N Y.





Makes a good cut-off for Grain Elevators.

IMPROVED WIND-GATE

SEND FOR PRICE-LIST AND DISCOUNT TO

MINER & PECK MFG. CO.,
NEW HAVEN, CONN.

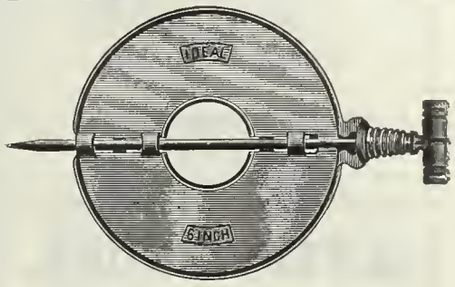
PIONEERS
LOW SPEED DYNAMOS, NICKEL ANODES, LACQUERS.

NICKEL PLATING OUTFITS

LEADERS
BUFFS, CYANIDE POTASH, TURKISH EMERY, POLISHING MACHINERY.

THE HANSON & VAN WINKLE CO.
NEWARK CHICAGO NEW YORK

IDEAL DAMPERS, COVER LIFTERS



AND POKERS



HAVE NON-HEATING HANDLES OF ELEGANT DESIGN AND FINISH. THEY ARE THE BEST.

STOVER MFG. CO.

164 RIVER ST.,
FREEPORT, ILLS.

By Thos. McNeil

THE STEAM AND HOT WATER FITTERS' TEXT BOOK.

140 Pages. Cloth.

TELLS HOW

To Estimate Radiation.
To Plan a Hot Water Job.
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One and Two Pipe Steam Work.
Heating with Exhaust Steam.
Blower System of Heating.
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And Many Other Important Things that Good Workmen Must Know.

ILLUSTRATED.

ONE DOLLAR, POSTPAID.

DAVID WILLIAMS CO., PUBLISHERS
232-238 WILLIAM ST., NEW YORK.

A No. 10 Fire Pot



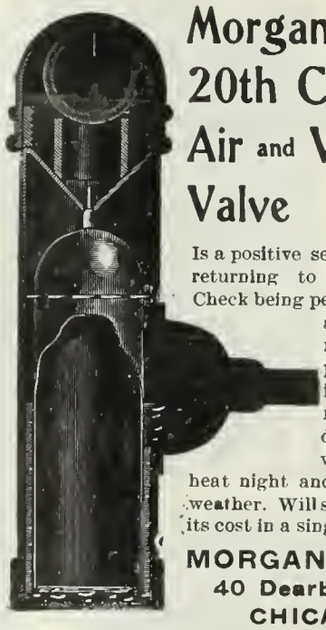
$3.00 Net.

If it bears ***our name means*** that the best material and labor has been used, and that ***we will refund your money if it doesn't please.*** Jobbers sell at factory price, or we will ship direct upon receipt of price named. Our catalog is free ; it tells all about them. It's worth dollars to you.

CLAYTON & LAMBERT MFG. CO.,
DETROIT, MICH., U. S. A.

ALWAYS IN STOCK.

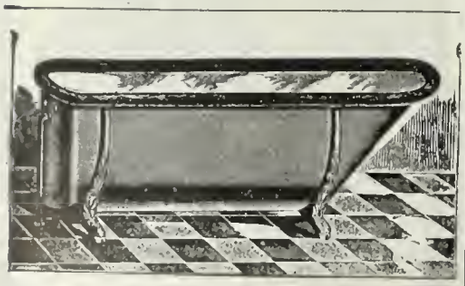
ALL SIZES OF
Galvanized range boilers, expansion tanks and boilers with copper tube coils inside for heating water by steam.
L. O. KOVEN & BROTHER,
Office 50 Cliff St., New York City.



Morgan's 20th Century Air and Vacuum Valve

Is a positive seal against air returning to the radiator. Check being perpetually balanced in water requires no pressure to lift it. A banked fire, with drafts closed will maintain heat night and day in mild weather. Will save four times its cost in a single season.

MORGAN & CO.,
40 Dearborn St.,
CHICAGO.

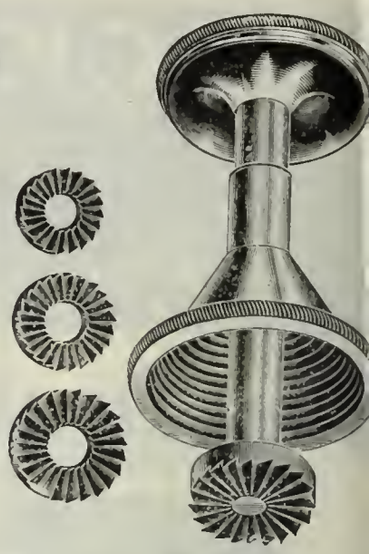


Day Metallic Manufacturing Co.,

DETROIT, MICHIGAN,
Manufacturers of
Steel Enamel and Steel Clad
BATH TUBS and HEATERS.

PLAIN FACTS

TO BE REMEMBERED
When You Buy Plumbing Goods.
WE ARE
LEADING MANUFACTURERS.
WE SELL
Honest Goods at Right Prices.
A TRIAL WILL CONVINCE YOU.
WRITE TO-DAY for LATEST QUOTATIONS.





Helpers' Friend Combination Plumbers' Furnace.
Faultless Bibb Seat Dressers.
Brass Basin Traps
Plumbers' Rubber and Leather Goods.
Gasolene and Alcohol Appliances.
Connected Wastes and Overflows.
Plumbers' Brass Ferrules.

American Distributing Company,

Factory: 200, 202, 204 Decker Street,
H. ROMEYN SMITH, Pres. SYRACUSE, N. Y

GEM

GASOLINE
SOLDERING FURNACES.
UNEXCELLED, UNEQUALLED, UNRIVALLED
FOR HEATING AND OPERATION.
NO SMOKE, NO ODOR, NO NOISE, SAFE, SURE, DURABLE.
WRITE
Burgess Soldering Furnace Co.,
COLUMBUS, O.



TRIMO PIPE CUTTER



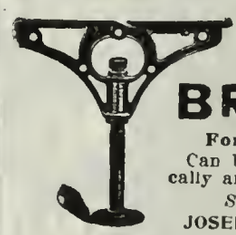
Decided improvement. Less friction. Can be changed from a roller to a three-wheel cutter. Extra wheels in the handle. Send for catalog.
TRIMONT MFG. CO., Roxbury, Mass., U.S.A.

OOLWELL LEAD CO.,

63 Centre Street, New York.
Manufacturers of
LEAD PIPE, SHEET LEAD, SHOT,
And Sellers of
Everything You Want for Plumbing.



GALVANIZED STEEL and WOOD TANKS.
All sizes and shapes
J. H. EDWARDS,
59 Park Place, N. Y.



BOSTON
ADJUSTABLE
BRACKET
For Sinks and Trays.
Can be adjusted both vertically and laterally.
Send for Circular.
JOSEPH H. YOUNG, Boston.

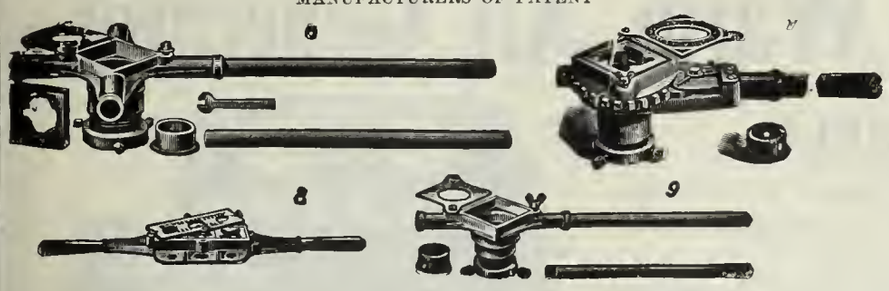
LEATHER and RUBBER WASHERS,

Machine cut, at less price than can be cut by hand. Send Sample for prices.
I. G. MARSTON & CO.,
200 Ruggles St., Boston, Mass.

JOHN H. LAWLESS,
Plumbers' Force Pumps,
184-186 Third St., Jersey City, N. J.
WRITE FOR CATALOGUE.

D. SAUNDERS' SONS.

MANUFACTURERS OF PATENT



STOCKS AND DIES.

Threading pipe ⅛ inch to 6 inch; the larger sizes have **CUTTING-OFF** attachment. These tools are light, strong and of superior design and finish; also **PIPE** threading **MACHINES** ¼ inch to 18 inch, hand or power. Send for catalogue to

27 ATHERTON ST., YONKERS, N. Y.

FORBES PATENT DIE STOCK

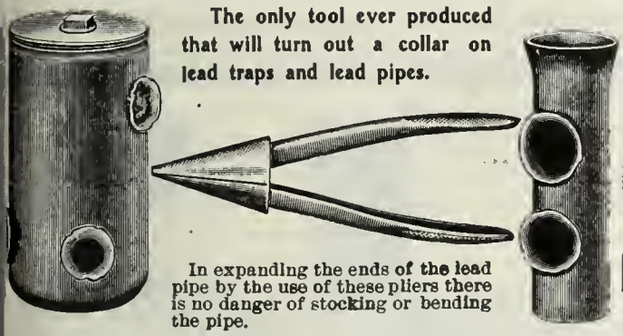


And one man can, with ease,
Cut off and thread a 12-inch pipe.
Smaller sizes proportionately easy.

Send for Catalogue.

THE CURTIS & CURTIS CO.,
56 Garden Street, BRIDGEPORT, CONN.

The Anderson PATENTED. Lead Pipe Expanding Pliers.



The only tool ever produced that will turn out a collar on lead traps and lead pipes.

In expanding the ends of the lead pipe by the use of these pliers there is no danger of stocking or bending the pipe.

"PLUMBER'S BEST FRIEND."

PRICE $1.25.

Send for Discount.

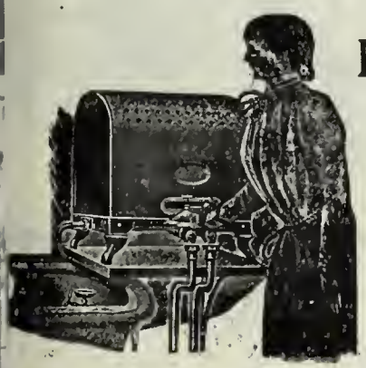
Sample pair sent by mail to any point in the U. S., postage paid, on receipt of price.

Manufactured by THE

Anderson Coupling Co.

PORTLAND, CONN.

THE VICTOR INSTANTANEOUS WATER HEATER



Is the cheapest, the most efficient and the neatest Water Heater made. It occupies but little space and is always ready, furnishing hot water in a few seconds day or night.

Send for Descriptive Circular, Prices, Discounts, Etc.

W. J. ADAM, - - Joliet, Ills.



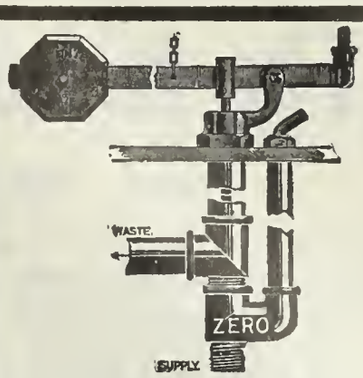
Thomson Smoke Machine

For Testing Plumbing.

WRITE US FOR BOOKLET AND PRICE.

GUNSTER & FORSYTH,

325-327 Penn Ave., Scranton, Pa.



SAVE HALF

The expense of installing closets by getting

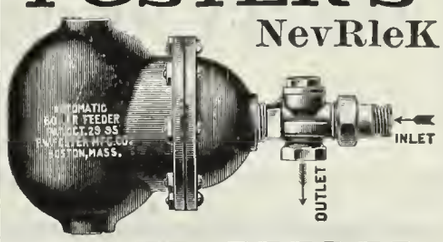
Zero Anti-Freezing Valves.

They can be put in with half the time and half the labor because they do not require a pit or vault.

They are simple and durable in construction—made without screws, springs or pins.

Zero Valve & Brass Mfg. Co.,
296 Seneca St., Buffalo, N. Y.

FOSTER'S NevRleK



BOILER FEEDER.

Our Booklet tells all about it.

F. W. FOSTER MFG. CO.,
12 Portland St., Boston.

NOTHING SUCCEEDS LIKE SUCCESS,

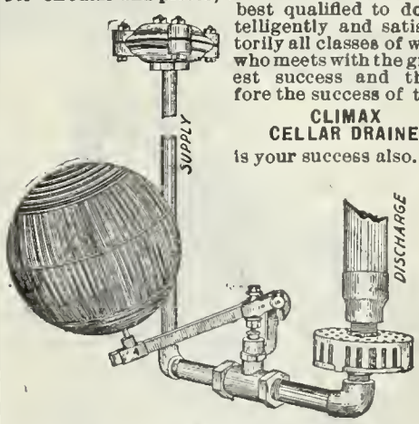
hence the unqualified success others have experienced with the

CLIMAX CELLAR DRAINER

should induce you to use it also. Your customers need This Drainer, and you should write to-day for circular and prices, because it is the Plumber best qualified to do intelligently and satisfactorily all classes of work who meets with the greatest success and therefore the success of the

CLIMAX CELLAR DRAINER

is your success also.



Years of effort have enabled us to produce a Drainer of marvelous perfection, entirely free from stuffing boxes, springs, packings and washers; a result not accomplished by any other manufacturer.

The simplicity, reliability and superiority of the **CLIMAX CELLAR DRAINER** are proverbial.

Sold by all Jobbers. Manufactured by

C. M. KEMP MFG. CO., - Baltimore.

—HIS REPLY.—Askington: "I believe you have a new girl baby at your house, Pillsbury?"

Druggist (absent minded, from force of habit): "Well, no; not exactly—but I have something just as good."—*Judge.*

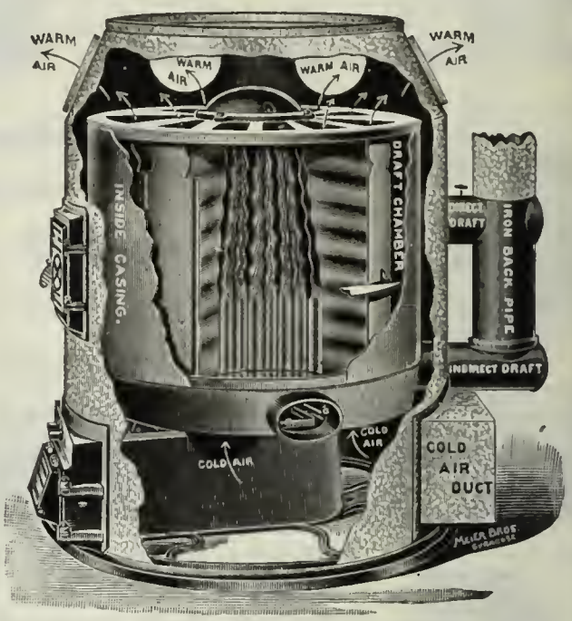
The Kelsey Warm Air Generator.

THE PRINCIPLE

Of the Kelsey is to warm great volumes of air by bringing it into **actual contact** with an **extensive** and **properly heated** surface.

This is accomplished by sending the air in **separate channels through** the long hollow corrugated cast iron sections which form the fire chamber.

This is a far more effective method, and the air is more thoroughly and evenly heated, than by simply **passing over** or **next to** a hot surface.



Sectional View.

Each section has eight square feet of heating surface, and weighs about seventy pounds. There are from nine to seventeen sections in each generator, according to its size. This means a powerful and economical heater, and an abundance of pure warm air. Each section is an independent heat generator, and by capping over one or more, and extending a heat-conducting pipe therefrom, the warm air is forced through long or level pipes to the rooms so connected.

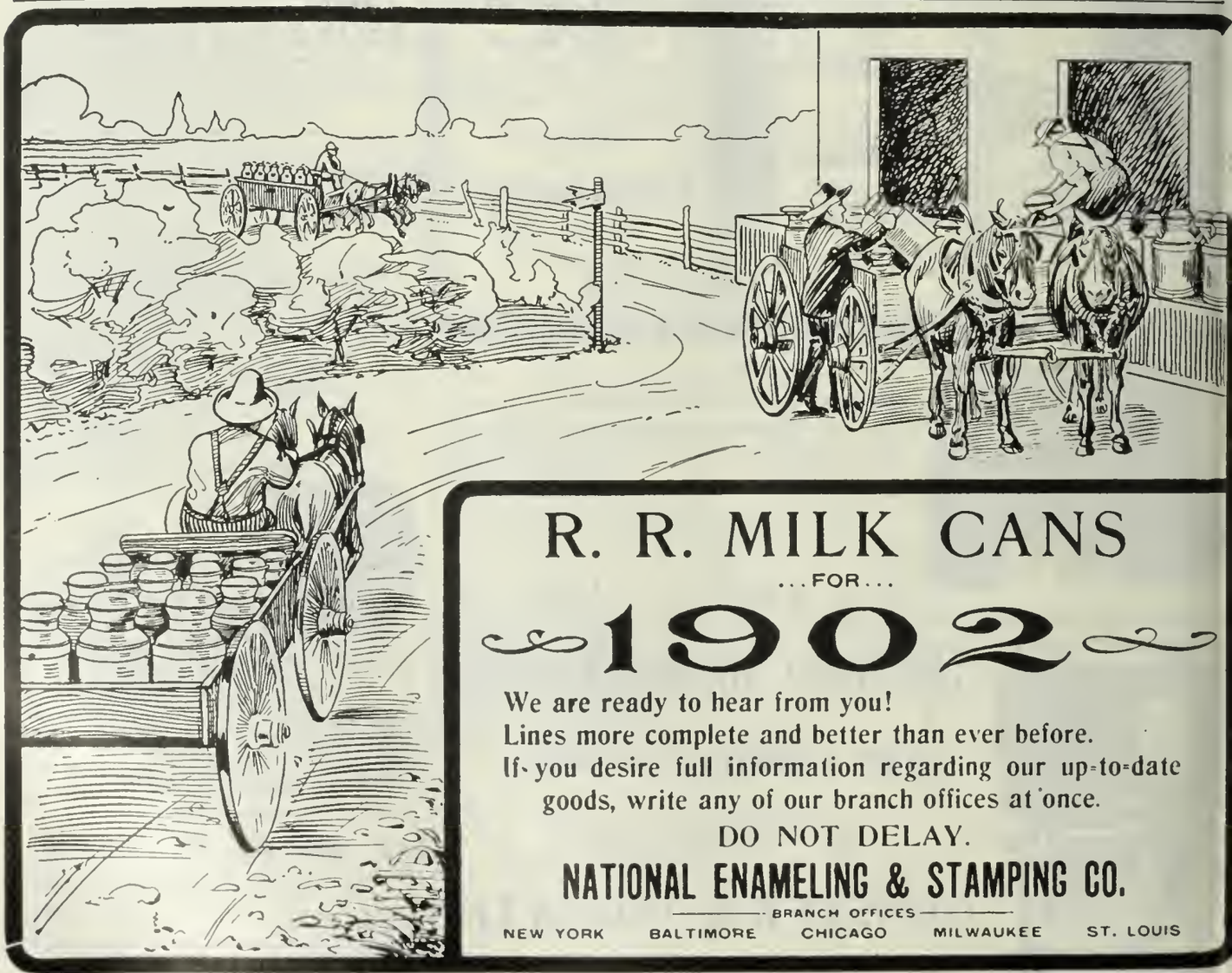
Ask for booklets **"KELSEY HEATING"** and **"OPINIONS."**

KELSEY HEATING COMPANY, SYRACUSE, NEW YORK.

NEW YORK OFFICE, 239 WATER STREET.

COOK & VAN EVERA CO.,
38-40 Lake St., Chicago, Ill.

"THERE'S ONLY ONE WARM AIR GENERATOR, THE KELSEY, AND IT IS PATENTED."



R. R. MILK CANS

...FOR...

1902

We are ready to hear from you!
Lines more complete and better than ever before.
If you desire full information regarding our up-to-date goods, write any of our branch offices at once.

DO NOT DELAY.

NATIONAL ENAMELING & STAMPING CO.

BRANCH OFFICES

NEW YORK BALTIMORE CHICAGO MILWAUKEE ST. LOUIS

THE METAL WORKER.

NEW YORK AND CHICAGO.

New York, March 8, 1902.

DAVID WILLIAMS COMPANY, - - - PUBLISHERS.

BUSINESS OFFICES:

NEW YORK.....232-238 William Street.
PHILADELPHIA.....117-119 South Fourth Street.
BOSTON.....33 Mason Building.
PITTSBURGH.....Room 509 Hamilton Building.
CHICAGO.....1205 Fisher Building.
CINCINNATI.....Rooms 22-24 Pickering Building
ST. LOUIS.....1205 Chemical Building.
CLEVELAND.....312 The Cuyahoga.
LONDON.....Hastings House, Norfolk St., Strand

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The Advancing Season.

For some weeks past the trade of the winter season has been falling off until, with the near approach of spring, it is almost lost sight of, and the enterprising tradesman is now afforded an opportunity to prepare for the change. Success comes to those who are prepared to meet the opportunity when it approaches. The stove dealer, the tinsmith and roofer, the corniceman and the plumber should all be using their spare moments to prepare for the demands that will be made upon them by the laggard citizen when he becomes aware that he needs something in their line. Men engaged in these different branches should foresee what their customers are likely to need and be ready for them when they come. With the energetic business man, even this is not sufficient. The advertising columns of the local papers should be utilized, and judiciously worded circulars distributed calling attention to the need of roof painting and strengthening up eave troughs and conductors, the purchase of a gas, oil or gasoline stove with summer cooking utensils, the provision of a larger gas supply pipe for the use of a gas cooking stove and the purchase of some suitable apparatus for supplying hot water when the coal range is out of use. These matters, together with visits to architects and builders in reference to new work, should keep many tradesmen busy at this time. Those who make advance suggestions of this character to the general public will not be forgotten when the necessities of customers become urgent. It is more than probable that other business beside that sought will also find its way to the establishment that becomes known for its enterprise. This fact should be sufficient incentive to have the shop and store look their best with freshly made up goods displayed to the best advantage, so as to produce the impression upon all who see them that goods and good workmanship are one of the trade-marks of the establishment, and prompt service one of its characteristics.

Programme Advertising.

One of the questions that received particular attention at the quarterly meeting of the Central Supply Association in Cleveland last week was that of profitable and unprofitable advertising. After considerable discussion of the subject it was agreed by resolution not to patronize souvenir programmes, theater programmes and advertising of kindred type. The demand for contributions of the character referred to has unquestionably become a grievous burden upon tradesmen and merchants generally. It has reached such magnitude that many business houses have now adopted a strict rule not to place their cards in anything but the regular mediums, such as trade journals, local newspapers or directories, from which there is a prospect of securing an adequate return for the money invested. This is a sound business policy and one that should be generally followed. It is time that a decided stand was taken in the matter by business men generally. It is far better to make a donation of money outright to any cause that is held worthy of support than to give it under the guise of advertising, and so furnish the promoters of the undertaking with the means of bringing pressure to bear upon other business concerns. Programme advertising is unquestionably unremunerative and as a matter of business should be discouraged. In some cases it is little short of a species of blackmail. Even where the causes sought to be benefited are in themselves admirable, the methods of those who secure advertising for publications connected with them are sometimes of such a "stand and deliver" kind that the unfortunate business man is coerced into giving up an "ad." against his better judgment and so creating a precedent of which solicitors of similar favors are not slow to avail themselves. He is presently swamped under an avalanche of demands for programme advertising for church fairs, social and benevolent societies, public ceremonials and what not. Better take a firm stand and consistently refuse all such advances on the ground of sound business policy.

Distributing Gas Under Pressure.

The official report made to the Fire Marshal of Chicago on the recent disastrous explosion of gas in that city contains the statement that natural leakages exist in all gas mains, varying from 10 to 25 per cent. "The leak," says the report, "usually seeks the air by the shortest route through the ground, vertically, if possible, but when the ground is frozen the gas cannot escape through the crust, but accumulates in pockets until, if not given free access to open air, it becomes mixed with air and explosive. An examination of gas mains in buildings near the scene of the explosion discovered the fact that not the smallest leak could be found in them. It was also found that gas of a similar odor, consequently of artificial production, exists in the sewers. If the sewers were not ventilated and frequently flushed it might accumulate in explosive quantity." The nuisance of the gas escaping from the mains through which it is distributed has become seriously objectionable whenever a street is opened for repairs of any character in most of the large cities. While it is improbable that any action will be taken by the authorities to force the gas companies to distribute their product through mains which will not, from leakage, make the opening of the streets a nuisance, the authorities can control the leakage or insist that the gas shall not be distributed under heavy pressure. At the meeting of the New England Association of Gas Engineers in Boston in February, a paper on "Distributing Artificial Gas by Pressure in a Subur-

ban Locality," was read by George F. Goodnow of Waukegan, Ill., in which the author said: "Heretofore it has been customary with gas companies to distribute their gas under a pressure of a few ounces, but within the past three years gas mains of small size have been laid through suburban districts, owing to the small cost, with the intention of carrying a pressure of 20 or more pounds per square inch, so as to deliver the gas at a distance of 12 or 14 miles. The point of compression without disadvantage to the gas has not been determined, but that a pressure of 25 or 30 pounds will not commercially deteriorate the quality of gas has been found in practice."

In the discussion of this paper the statement was made that "high pressure, in the sense of distributing gas through mains at 10 to 15, 20 or 30 pounds, has not only come to stay, but is growing and growing rapidly. The original line was built at Phœnixville, Pa., but two years ago, and now there are nine such pressure distributing gas systems in different parts of the country. It has been found useless to attempt to stay the hand of progress, and the fact that suburban districts that otherwise could not be supplied with the convenience of gas lighting system can be supplied profitably by small mains under high pressure is sufficient in itself to cause an extension of the custom." In view of the report of the Chicago official, however, it would seem advisable for municipal authorities to take more interest in the character of the gas mains laid, and the method of laying them in order to prevent a leakage, which is not only objectionable but dangerous. As benefit appears to be derived from the new method of distributing gas, it is quite probable that high pressure gas distribution will be attempted in old mains, or that the same material that has heretofore been used in the low pressure mains will, in order to save the cost of plant, be used in smaller mains and high pressure resorted to in order to supply the customer. It has already been demonstrated that very small pipes under high pressure will supply a much larger quantity of gas than was formerly considered possible by experts familiar with the old low pressure system. Under the circumstances, however, it would seem possible that all the advantages attending the high pressure system could be obtained, along with safety and the abolition of the nuisance of leaking gas, if what was saved in the cost of building the mains was expended in having them constructed of a gas proof material.

Oil in Lieu of Water.

A remarkable report comes from New Orleans to the effect that John W. Gates, the steel magnate, who is largely interested in the Beaumont oil industry, has offered to buy the New Orleans water works for $2,000,000, not with the idea of supplying the city with water, but with the design of closing the mains for water purposes and reopening them for use in the distribution of oil. The plan attributed to Mr. Gates is to convert the present reservoir of the New Orleans water works, which holds about 20,000,000 gallons, in a huge tank for the storage of Beaumont oil, using the 500 miles of mains connected with it, and running into every factory and to most of the private houses of the city, for the conveyance of oil. It is claimed that New Orleans could thus be supplied with fuel at a cheaper price than any large city in the world, with the added advantage that consumers would only have to turn on the water cock to get as much oil as needed, the meter keeping an account of the amount supplied. Mr. Gates proposes, it is said, to pump the oil to the New Orleans reservoir from the Beaumont fields, and from the reservoir to distribute it by natural pressure, without pumping, to all parts of the city. According to the correspondent of the New York *Commercial*, from whom this information comes, there are two difficulties which stand in the way of Mr. Gates' plan, one being a litigation over the title to the water works and the other the question whether the underwriters and the City Council of New Orleans will consent to the water mains and pipes being used for conveying oil, thus converting New Orleans, as it were, into a great oil reservoir, with its soil everywhere saturated with this combustible substance. Mr. Gates, however, is said to be perfectly confident of his ability to overcome these drawbacks. The idea ascribed to him is novel and characteristically audacious. If carried into effect, a consummation which seems open to doubt, it might possibly lead to a revolution in the system of oil supply in cities. It is not clear, however, from the published report, whether Mr. Gates contemplates cutting down the water supply of the inhabitants of the Crescent City and substituting oil therefor. Such a proposal would be apt to lead to complications which would present more obstacles to the plan than those suggested above.

Paterson's Misfortunes.

The thriving manufacturing city of Paterson, N. J., has had a bitter experience in the past few weeks. While just struggling up manfully from the effects of the disastrous fire which laid its business section in ruins and strained to the utmost its recuperative energies, the city has received a second, and in some respects a more severe blow in the flood which this week devastated the manufacturing district and the poorer parts of the city. In the case of the fire the losses fell more directly upon the substantial class of citizens who were generally well insured, and but few people were thrown out of work. Now, however, the poorer citizens are the principal sufferers, the flood having not only invaded that part of the city in which they live, causing heavy personal losses to a large number of people who are ill prepared to sustain them, but also having damaged the mills and factories in which they were employed to such an extent that many of them will be closed for an indefinite period and their employees will be subjected to the distress consequent on enforced idleness. Seldom do two such severe disasters attack a city in so close a sequence. A community that has shown such admirable pluck and self-reliance as Paterson has displayed since the recent fire deserves the generous sympathy of the whole country in its latest visitation.

The floods and storms have been interfering again with both production and consumption of iron at a time when any delay is very seriously annoying. They threaten to prolong the shortage of material beyond the spring months, and are making more and more difficult the endeavors of important interests to accumulate finished goods in anticipation of the usual spring trade.

The fire loss of the United States and Canada for the month of February, as compiled by the New York *Journal of Commerce*, shows the enormous total of $21,000,000, as compared with $14,000,000 in February, 1901, and $15,000,000 in the same month of 1900, both of which were regarded as unusually disastrous months for the insurance companies. The Paterson and Waterbury conflagrations, of course, swelled this sum immensely. Both of those great fires are supposed to have been of electrical origin, and many experienced underwriters are of the opinion that electricity is responsible for the great increase in the fire losses of recent years.

STOVE AND FURNACE INTERESTS AT THE MINNESOTA HARDWARE CONVENTION.

Stove and furnace houses were well represented at the sixth annual meeting of the Minnesota Retail Hardware Association, held in St. Paul on February 26, 27 and 28. Numerous exhibits in this line were made in the parlors of the Hotel Ryan. The exhibits, however, were not confined to that hotel, displays being made at other places in the city. In the subjoined allusions to these displays it is to be observed that all were made in the hotel named except as specifically stated.

Buck's Stove & Range Company, St. Louis, made an exhibit consisting of Radiant high grade art base burners, steel ranges, steel cooking stoves and oak stoves in the Hotel Ryan. They also had an exhibit of their Great White Enamel line of stoves and ranges in the store at 436 Wabasha avenue. Here they displayed what is claimed to be the largest sample exhibit of stoves and ranges in the Twin Cities, comprising over 60 patterns. They distributed neat memorandum books for the use of members of the convention. J. F. Stapleton represented the company.

Rathbone, Sard & Co., Aurora, Ill., made a fine exhibit of Acorn stoves and ranges. Samples were arranged on cloth covered platforms 12 inches high, having the front of the platform beveled, with the name of each stove placed below it in large letters. The stoves shown comprised the Art Westminster, a base burner of the highest grade; the Century steel range, the New Modern steel range, the Rapid four-hole steel range, the Rival steel cook, the Albany oak, with duplex grate; the Classic high grade cast range and the Ivy wood base burner. A special feature of this exhibit was a number of large charts, hung on the wall, giving diagrams of correct and faulty chimneys. Specimens of stove pipes and chimney tops were also shown of special designs to secure draft. W. W. Strayer was in charge and distributed stick pins having aluminum acorns attached.

The Detroit Stove Works, Detroit and Chicago, made a good exhibit of the Jewel line. The samples shown consisted of the Domestic, a medium grade steel range; the Leader, a low priced, first-class steel range; the Bridal steel cooking stove and the Crown Jewel, a medium grade base burner. J. Allen Hasty was in charge.

F. & L. Kahn & Bros., Hamilton, Ohio, exhibited several samples of their Estate line of stoves and ranges. These comprised the Metal Estate four-hole cast cooking stove, the Estate oak and the Umpire Estate air tight. The oak stoves are highly decorated, having a heavy nickeled canopy overhanging the fire pot instead of the usual small foot rail. The air tights are also handsomely ornamented. W. L. Nesbitt had charge of this exhibit.

The Round Oak Stove Works, Estate of P. D. Beckwith, Dowagiac, Mich., were represented by J. O. Becraft and G. T. Adams, who occupied a large parlor which was visited by a constant stream of members. They distributed nickel plated Doe-Wah-Jack match boxes and Round Oak stick pins. Mr. Becraft was the recipient of a valuable testimonial from his admiring colleagues among the manufacturers in attendance on the convention, and the testimonial will undoubtedly be preserved among his most highly treasured mementos of convention experiences. It was accompanied by a certificate bearing the names and official designations of those who participated in the expense attached. The presentation speech was made by H. H. Roberts of *The Metal Worker*.

The Charles Smith Company, Chicago, exhibited samples of their furnaces and water heater attachments. Chas. Smith represented the company.

W. H. Bliss, representing the Robinson Furnace Company, Chicago, showed a model of the Robinson tubular furnace.

The Minnesota Stove Company, Shakopee, Minn., were represented by President G. L. Nye, David Meiss and A. E. Mattison. They found no difficulty in exhibiting their Coral line of stoves and ranges at stores in the vicinity. The company are building up a good trade in the Northwest. Mr. Nye entertained a theater party on Wednesday evening, showing his broad spirit by including another stove manufacturer among his guests.

The Roberts Heating & Ventilating Company, Minneapolis, showed the Storm King furnace of their Floral City line. This is a furnace having a steel plate body and a steel plate radiator, giving twice the fire travel and nearly double the heating surface of the ordinary furnace. They also exhibited samples of furnace fittings, which they are now manufacturing with special machinery, consisting of boots, stacks, &c. The company are Northwestern agents for the Perfect Gem steam and hot water heaters. Oliver N. Roberts was in charge.

The Abram Cox Stove Company, Philadelphia, made a large display of Novelty stoves and furnaces at 419 and 421 Jackson street. T. M. Gilfillan represented the company.

Enterprise Stove Company.

The 92-page catalogue which has been issued by the Enterprise Stove Company of Vincennes, Ind., shows an extensive variety of steel and gas ranges, cast cook stoves, heaters, &c. The goods are offered under the generic name Star, which, as a trade-mark, has become well known throughout many sections of the country. The leading place in the catalogue is given to the Domestic Star steel range for coal or wood, which embodies in its construction all the modern improvements. The exterior is embellished with cast ornamentation, in combination with nickeled parts, producing striking effects. The range is made in several styles and sizes, thus adapting it to many requirements. Among the cast goods may be mentioned the Grand Star, the Guiding Star and the Royal Star ranges, some of which are adapted for using coal or wood, while others are intended for burning wood only. The Watson Star is a steel cook, made with cabinet base and intended for using coal or wood as a fuel. This is referred to by the makers as "the best selling style of steel cook made, as the cabinet base gives the general appearance of a steel range." The body is of blue polished steel, and there is a large pouch feed door when coal is used, a broiler door with register, and the oven bottom is securely braced so as to prevent warping or buckling.

In the way of cook stoves, mention may be made of the Rising Star, the Guiding Star, the Grand Star, the North Star and the Royal Star. The heaters are represented with the Star Radiator as one of the leaders. This is not an air tight, being constructed on different principles. It is made in two grades, one of which is full nickel, while the other is minus the front rail and nickel columns. The Star Oak, with an air tight base, is another handsome construction for which strong claims are made. It is rich in its external treatment and the constructive features are of the modern type. Other goods include cottage parlor, Franklin, globe, cannon, laundry, Todd and air tight stoves. In the concluding pages attention is given to the Star Progress line of gas ranges and to the Star gas hot plates. Some valuable suggestions regarding good and bad flues are presented, together with directions for setting up and operating stoves.

"Steel Stoves for Summer Service and Dainty Dishes for Particular People" is inscribed on the front cover of a little pamphlet devoted to the Jewel Gasoline Stoves, made by the George M. Clark Company, Chicago. The catalogue is printed with a very pretty effect in black and green, and interspersed with illustrations and descriptions of the Jewel Smokeless Generator Gasoline Ranges are a number of pages of receipts for summer foods. One page is devoted to the Jewel Heaters, which are especially adapted to the use of householders for supplying hot water during the hot period, when there is no range fire to heat the usual hot water storage tank.

WESTERN IDEAS ON FURNACE HEATING.

BY IOWA.

An interesting and instructive article in the February 1st number of *The Metal Worker*, from the pen of C. E. Oldacre, has been carefully read by me, and I find it to be the result of close observation and full of good suggestions and help for heating men. But it fails, according to my experience, in a vital point. It adheres to the old idea of taking all cold or fresh air from outdoors. Mr. Oldacre says: "Return fresh air ducts are not to be commended;" "They are unsanitary, to say the least;" "Are not to be depended on as a rule;" "Good lodging places are afforded for microbes and germs of all kinds;" "Very bad should there be any sickness in the house;" "Any saving in fuel is undoubtedly at the cost of health."

Let me draw from my experience of 20 years in using what is known in Iowa as the "rotary method of handling the air." If Mr. Oldacre was in Iowa it would keep him busy to find a furnace run on his method. All run their furnaces on the "rotary" method, yet none of the bad consequences feared by him are to be found. The Campbell Furnace Company of Des Moines were among the first to advocate this system in Iowa, and they had to make a fight for it, which they have made to a complete finish in Iowa and parts of other States.

WHAT ARE THE ADVANTAGES OF THE ROTARY SYSTEM?

It takes less fuel to heat a given space. The saving is from 20 to 50 per cent., depending on construction of house.

It gives the only possible plan for getting thorough circulation of the air. It continually exhausts the cold air, draws the warm air from the ceilings down, warms the floors and evens the temperature. You don't have to keep the babies on the bed or keep your feet in two candy buckets to keep them out of the 2 feet of cold air on the floors, as by the old method. It evens the temperature all over the house. If one room has a tendency to be cold from winds, the cold air duct affecting it works more rapidly and the warm air moves in to balance the effect. The method works to perfection, not an inch of cold air resting on the floor when the cold air ducts are properly built.

When I was a boy I attended a church, and it was like all of the other churches from Maine to Los Angeles. They fired the furnaces to their destruction. If you sat in the pews you froze; if you sat in the gallery you cooked, and there was no floor midway where the temperature was just right. There we went to church, winter after winter, and suffered because we were ignorant of so simple a matter as the rotary movement of the air.

EXHAUSTING FOUL COLD AIR.

A stupid theory about ventilation for a time came to people's relief, partially. Scientists (ventilating) taught that the bad air was at the floors, because the "carbonic acid gas" thrown off by the lungs was specifically heavier than the air and therefore—so they reasoned—must fall to the floor (which is not true). So they built ventilating flues to take the supposed bad air from the floors. These, small and insufficient as they were, served a great purpose in causing the cold air to be pulled off the floors and the warm air to come down from the ceiling. They were no longer trying to fill a jug which was already full and which had no outlet.

This new "rotary" method is a still further advance, and is perfection itself in securing circulation of the air, which is the foundation and prime necessity of all good heating. For instance, in common sized houses we use ordinarily as much as three 20-inch galvanized iron pipes to carry the air from the floors to the heater, passing the air of the entire house through our "heating oven" several times every hour. The effect is marvelous. A prominent physician of Davenport, Iowa, says: "The difference in temperature between the floor and at the hight of 7 feet was from 2 to 4 degrees by actual test." This was in a very large 16-roomed house.

QUALITY OF THE AIR AND HUMIDITY.

Another advantage of the "rotary" air movement lies in this, that the air can be given any quality desired. It can be charged with disinfectants; it makes the air movement itself a disinfectant of the house. Few disease germs can live in a house heated on this plan. Further, it provides the only practical method known for giving the air of the house its natural and proper moisture. In weather near the zero point air will only carry about a grain of moisture to the cubic foot. Raised to a temperature of 75 degrees, it demands 8 to 10 grains. This is the cause of the dryness of furnace heating and heating by steam, stoves and hot water—by all heating that does not supply this demand resulting from the expansion of the air.

There has been a great deal of ignorant talk about furnaces, &c., destroying the moisture in the air. This demand from expansion must be supplied. This is the remedy. Our artificial heating has been the same as our heating to dry fruit or lumber—the expanded air in these cases took up the moisture not wanted. In our house heating it has licked up the moisture needed in the wood work, in the piano, in the plants, in the lungs, in the skin, in the eyes, &c.

Charles Abbott, a blind piano tuner of Iowa Falls, Iowa, said to the writer:

I have known in my work at least 75 pianos ruined by dry heat, causing the shrinking and cracking of the sounding board, and the drying effect on the hammers injuring the felting and causing lost action. When a piano is once damaged in this way there is no repairing it. It is ruined for good.

A piano tuner, writing to the *Musician*, says:

Now, when you put a piano in an overheated, dry room, all this moisture is dried out, and the sounding board loses its "belly" and gets flabby, and finally cracks. Even if it doesn't crack the tone loses its resonance and grows thin and tinny, and the felt cloth and leather used in the action dry up, and the whole machine rattles, and everybody kicks.

To moisten the air by the old method never has been satisfactorily achieved, although tried. It is impracticable.

PROPER MOISTURE TO AIR.

By the "rotary" method the proper softening of the air becomes simple, inexpensive, automatic and capable of complete and easy regulation as to quantity. This method we have used in over 1000 heaters. It has the indorsement of Dr. Kennedy, secretary of the State Board of Health of Iowa, and Dr. S. W. Williston, medical adviser of the State Board of Health of Kansas, writes: "I congratulate you upon having solved the problem of sanitary heating in a most satisfactory way."

Space will not permit further consideration of this most interesting and vital point concerning the healthfulness of a proper moisture supply to the air. If any one seeks to take issue with me I can give evidence and explanations that will close the question. From two to four barrels of water (open for evaporation) are used by one "rotary" method. The water is also used for storage of heat. An ordinary dwelling uses about 6 gallons a day in cold weather.

CLEAN AIR AND SUPPLY.

Still another advantage of this "rotary" system is this: Furnaces are mostly used in cities. Cities in winter are proverbially dirty and supplied with smoky, gas polluted, foul air, scarcely ever fit to take into a house. A sufficient supply of fresh air will in most cases filter into the house through the walls and a thousand crevices and be comparatively clean. In ordinary dwellings foul air is a bugbear of the wrongly educated imagination. The old method of bringing in air from outdoors was not for ventilation—that was a "blind." It was used because the furnacemen did not know of any other way to get the heat of their furnace into the house. So the air was rushed in—dirt, smoke and all—to the disgust of the entire furnace using world. That all this is a correct view is shown by the fact that the same amount of fresh outdoor air was provided for a house occupied by one old grandmother as for one having 25 robust occu-

pants. The continual circulation of the air of the whole house with the continual change of air—warm air passing out and cold air coming in—provides ordinarily all the fresh air needed. If any one thinks he must have an outdoor pipe he can have it, as it in no manner interferes with the constant "rotary" air movement of the house. He must have the "rotary" movement, and he can have both. When this "rotary" movement was first introduced it was denounced as "unsanitary," "criminal," "vicious," "destructive of the health of the people" and a "ridiculous merry-go-round." Every one of the parties who thus attacked it hereabouts is now using it in his furnace business.

Furnace Work Records.

The value of records of successful practice in any line of work has long since been established, yet the earlier furnacemen have left little that may be referred to for guidance in designing new work or locating errors in bad work and applying a remedy. With a view to aiding furnacemen in keeping a record of the dimensions of various parts of their work, a blank form is presented herewitb which will enable a record of several jobs to be preserved, so that comparison can be made and the important factors observed for guidance in future work. The value of such records would be very great to a man, for example, who, from any cause, finds himself obliged to take up the furnace work of an establishment as a new branch of business to him. If kept carefully it will enable a comparison to be made of the merits of different constructions of furnaces, piping, arrangement, &c.

The blank gives some of the important dimensions that should be recorded and also bears an example showing its intended use. It should be stated, however, that the figures given in reference to "John Smith's" house are purely fictitious and of no value except to explain how the blank may be filled in. The blank is presented simply as a suggestion and may need changes to adapt it for general usefulness and convenience.

If furnacemen will examine the blank and fill it in with the records of some piece of work they will doubtless better understand its usefulness to them and to the men they are training in this branch of business. It is probable, also, that suggestions will occur to them as to an extension or remodeling of the blank, or as to supplementary blanks that may be considered equally advantageous for making a more detailed record of one building and its exposure, together with a record of an efficiency test with the temperature at various points. Copies of the blank of a larger size have been prepared and will be sent on application to those who desire them.

In other branches of the heating trade better records have been kept than in the furnace branch. There seems to be evidence, however, that furnacemen are giving more attention to the theoretical side of their work than heretofore. This is an indication of progress. Deductions from practical work can be better made when a tabulated record of it can be studied or referred to.

The record blank given herewith is commended to furnacemen, and their views, comments and suggestions in reference thereto are invited, in order that the interests of all engaged in hot air heating may be advanced by a discusison of the plan. Should something that may be universally approved and generally used for preserving data on furnace heating grow out of this blank there can bc no doubt of its benefit to the whole trade. If such a record is well kept for different classes of buildings it would enable the possessor to judge with certainty as to what should be provided to secure successful heating.

THE METAL WORKER RECORD OF FURNACE WORK.

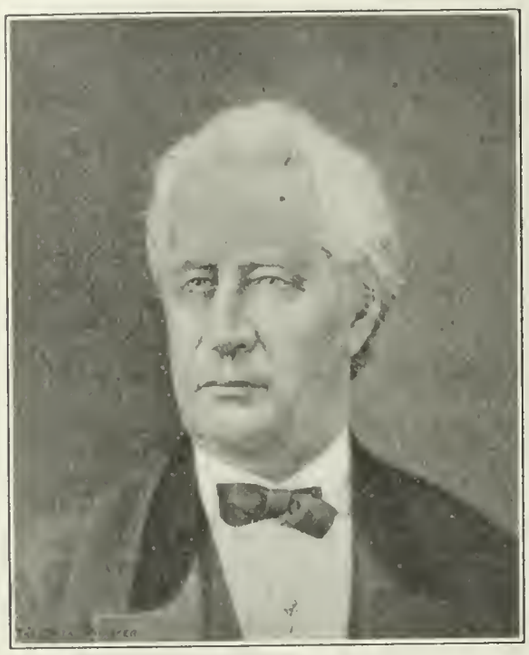
If this blank is filled out as shown by the example given below, it will serve as a valuable guide in planning other furnace jobs.

Building Heated.	Grate Surface. Dia.	Grate Surface. Area.	Heating Surface. Sq. Ft.	Type of Furnace.	Coal Burned per Season. Tons.	Space Heated. Cubic Feet.	Outside Dimensions and Character of Building.	Wall Surface. Square Feet.	Number and Size of Windows.	Glass Surface. Sq. Ft.	Equivalent Glass Surface. The E. G. S. equals the glass surface plus one-quarter of the difference between the wall surface and the glass surface. Square Feet.	Number and Size of Hot Air Pipes.	Area of Hot Air Pipes.	Size and Area of Cold Air Supply. Inside:	Size and Area of Cold Air Supply. Outside.	Proportion of Hot Air Pipe Area to Space Heated. Sq. in. to cu. ft.	Proportion of Hot Air Pipe Area to Equivalent Glass Surface. Sq. in. to sq. ft.	Proportion of Grate Area to Space Heated. Sq. in. to cu. ft.	Proportion of Grate Area to Equivalent Glass Surface. Sq. in. to sq. ft.	Proportion of Grate Area to Heating Surface. Sq. ft. to sq. ft.	Proportion of Heating Surface to Space Heated. Sq. ft. to cu. ft.	Proportion of Heating Surface to Equivalent Glass Surface. Sq. ft. to sq. ft.	Temperature at Register.	Temperature of Air Outside.
JOHN SMITH'S RESIDENCE.	30″	706	80	*All cast iron. Indirect draft. Inside casing.*	20	37,000	*3-story brick. Ceilings, 10, 9 and 8, 30 x 45 x 32.*	4800 750 4 (4050 1012	50 3-X5=15 50 750	750	750 1012 1762	10 2- 9- 63 2- 8- 50 5-10- 78 1-12-113	126 100 390 113 729	20x20 400	10x20 200 600	1-50	1-2.1	1-50	1-2.1	1-16	1-962	1-2	150	0

GRANGE SARD, president of Rathbone, Sard & Co. of Albany, N. Y., has been elected president of the New Union Trust Company of that city. Mr. Sard, who is also president of the Park Bank and vice-president of the National Commercial Company of Albany, is regarded as one of the city's most able financiers and business men.

DEATH OF JAMES S. LITHGOW.

James S. Lithgow, president of the Lithgow Mfg. Company of Louisville, Ky., died on Friday, February 21, at his home, 1669 East Broadway, Louisville, in his ninetieth year. His death, caused by old age, was an absolutely painless passing away. In a recent issue we presented a sketch of the career of this veteran stove manufacturer on the occasion of entering his ninetieth year. Mr. Lithgow was born in Pittsburgh, Pa., on November 29, 1812, his parents being Walter and Frances Lithgow, both of whom were of Scotch-Irish descent. During the war of 1812 the elder Lithgow served as a soldier in the American army and took part in a number of engagements. The son, James S. Lithgow, spent his youth in Pittsburgh, but in 1833, when 21 years of age, moved to Louisville, where he had resided ever since, a period of nearly 70 years. Arriving in Louisville without means he started out to look for work, and the next day found a place in the tin and sheet iron shop of Bland & Coleman, where he worked for a short time. Subsequently he found employment with Andrew Barnett, a retail stove dealer, who also operated a tin shop. The



JAMES S. LITHGOW.

next employment was with Hicks & Taylor. During his engagement with that concern he became acquainted with Allen Wallace, a fellow workman, who subsequently became his partner, the firm of Wallace & Lithgow being organized in 1836. By industry and strict integrity this firm became one of the most prominent and successful in what was then known as the West. Early in their history they established a stove foundry. The firm continued until 1863, when Mr. Wallace died. A short time later the firm of J. S. Lithgow & Co. were organized, the members being J. S. Lithgow, J. L. Smyser and C. O. Smith. They built a factory at Clay and Main streets and an office building at Third and Main streets. At the time of the great financial panic of 1873 they were forced to suspend business, and later to dissolve. Subsequently the Lithgow Mfg. Company were formed, and have continued in business ever since, obtaining a high reputation for their Capitola stoves and ranges, Lithgow warm air furnaces, mantels, grates, &c. To-day they are among the leading manufacturing concerns in the South.

During his long career of 66 years in the stove and tinware business Mr. Lithgow was also interested in a number of other enterprises. He was for several years president of the Northern Bank of Kentucky, and at the time of his death was a director of the Franklin Insurance Company. He was also largely interested in the Jeffersonville Car Works and in several Southern railroad companies. In 1865 Mr. Lithgow was elected Mayor of Louisville, having previously served as a member of the Board of Councilmen and also as Alderman. He served as Mayor until 1867, when he resigned. Mr. Lithgow was one of the founders of the Louisville Fire Department and when a young man served in the Volunteer Firemen's Association of that city, of which body he was much the oldest living member. James S. Lithgow was a citizen of whom Louisville was proud. Living in that city for nearly three-quarters of a century, he was active along every line of work to the advantage of the community, and was also a prominent figure in business life. He was also prominent in church affairs and was six times a member of the General Conference of the Methodist Episcopal Church, South.

He was married in 1837 to Miss Hannah Craig, who was born in England and who died about 11 years ago. Of the seven children of this union four married daughters are living, as well as 19 grandchildren and ten great grandchildren. The two sons, Wallace Lithgow and J. S. Lithgow, Jr., predeceased their father, the last named being killed during the Civil War. Mr. Lithgow's funeral, which took place on Monday, February 24, at the Broadway Methodist Episcopal Church, was attended by most of the prominent citizens of Louisville. The body was interred in Cave Hill Cemetery.

"Opinions About the Kelsey Warm Air Generator."

The above title is embossed in silver on the drab cover of a 164 page book printed in two colors, issued by the Kelsey Heating Company of Syracuse, N. Y., with offices at 239 Water street, New York; 38 East Lake street, Chicago, and Brockville, Ont. The first page gives an account of the award received by the Kelsey generator at the Columbian Exposition at Chicago in 1893, and shows pictures of the medal awarded to the generator at the Pan-American Exposition in Buffalo. The next eight pages are devoted to half-tone engravings showing the entire construction of the Kelsey generator. The text gives such a description and explanation of it as to render the operation perfectly clear. The remaining pages are occupied by half-tone engravings of fine residences throughout the United States in which the Kelsey generator has been used for heating, and interspersed are testimonial letters, giving considerable information as to the coal consumption, heating capacity and other special features of merit which have been discovered in the every day use of this apparatus. Engravings are also presented of extra large residences, school houses, police stations and other spacious buildings, together with pictures of the Kelsey furnace set in a battery for heating large buildings.

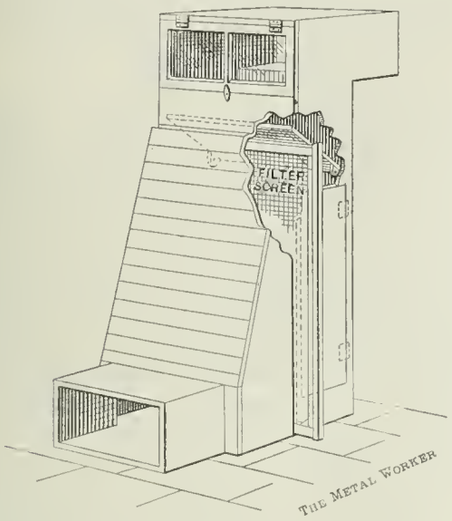
A section of the catalogue is devoted to the opinion of dealers whose experience is based on the use of the generator for a number of years, some using more than 32 generators in one season. The last section of the catalogue is given up to churches, and a long list of the different towns in which churches, schools and large buildings are heated with Kelsey generators. Some pictures of buildings, in which the James Smart Mfg. Company of Brockville, Ont., have installed Kelsey generators, are also given. These views show fine buildings, and they are accompanied by testimonial letters from towns in various parts of the country where the company have established a trade. "Opinions About the Kelsey Warm Air Generator" is designed for distribution among prospective purchasers, and it should materially aid the furnace heating contractor in any section where the work is distributed.

The last page of the book is printed on blue paper, perforated so that it can be removed. On one side of the sheet is a series of questions intended to assist a prospective buyer in describing his building, and on the other side are two unfilled squares, ruled, to aid in drawing a plan of the building to be heated.

THE report that the New Castle works of the Pittsburgh Stove & Range Company would be removed and consolidated with one of the other plants of the company near Pittsburgh is denied.

SETTLING AND FILTERING CHAMBER FOR FURNACES.

Furnacemen are frequently called upon to furnish a furnace with a proper fresh air supply and at the same time prevent the entrance of soot and dust and overcome the effect of the wind blowing directly through the furnace. The William Miller Range & Furnace Company of Cincinnati, Ohio, have taken out patents for a settling and filtering chamber, by the use of which they claim that proper ventilation and a clean air supply are assured. Fig. 1 presents a broken view of the device. As the filtering screen occupies a vertical position, it is said to make provision for the entrance of a sufficient quantity of air to the furnace by presenting a large surface that does not fill up quickly and obstruct the entrance of air. The vertical position also allows the heavier dust carried in with the air supply to settle. The chamber is provided with a door so that the dirt can be removed as it accumulates before the screen is taken out for cleaning. It is also furnished with a controlling valve so that a maximum or minimum quantity of fresh air can be provided for the furnace at all times. The door that is provided in the chamber enables the air to be taken from out of doors or from inside of the building, as may be found desirable. This chamber is constructed of well seasoned, matched lumber so that no dust can get into the chamber from the cellar. The device is recommended for the cleanliness and pleasantness of the atmosphere that is maintained where it is used. The company manufacture it in three regular stock sizes, so that it can be shipped, knocked down and assembled by any ordinary carpenter on receipt at destination. Fig. 2 shows one of the filtering chambers in use in connection with a furnace, from which it can be readily seen that however dusty may be the air that enters the supply chamber the filter will clean it before it is passed to the furnace and through it to the registers.



Settling and Filtering Chamber for Furnaces.—Fig. 1.—Broken View, Showing Damper and Filter Screen.

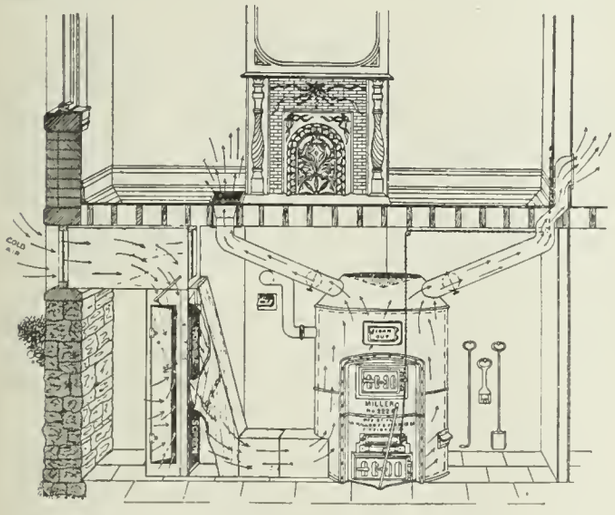


Fig. 2.—Showing Apparatus in Use.

Kernan Registers.

We have received from the Syracuse Stove Works of Syracuse, N. Y., with branch office at 231 Water street, New York City, a copy of their 1902 catalogue of Kernan improved hot air and ventilating registers, which has just been issued from the press. The catalogue is gotten up in very artistic style, with sage green folding cover and deckle edges. The whole is inclosed for mailing in a dark green envelope, and the address written in white ink has a striking effect. The catalogue is finely printed in black and red and contains numerous halftone engravings of the company's Græco-Roman design of registers. The pages are further embellished with artistic headings and tail pieces. The special points of merit embodied in these registers include simplicity of construction and operation, the special construction of the box and valves, thickness of ends on valves, evenness of movement, unusually large air area of face opening and the general excellence of design and finish. It is further pointed out that the borders and faces are interchangeable with standard makes. By means of a patent brass non-corrosive nut case with sleeves the operation of the lever is made absolutely noiseless, smooth and easy, so as not to interfere with the thermostat attachments. These registers are made in black and white japan finish, imitation gold, silver or copper, bronze, nickel plate and electro plated in brass, bronze or copper and of oblong or convex form, also with circular top. The thermostat attachments are especially recommended for use in school houses, where these features will be found of great advantage. Slate and soapstone borders for registers are also shown in the catalogue, as well as face plates made extra heavy and highly finished in black japan.

The Indianapolis Stove Company.

We have received from the Indianapolis Stove Company, Indianapolis, Ind., a copy of their catalogue No. 107, relating to both steel and steel clad ranges and cook stoves, hot plates, hollow ware, &c. It consists of 72 pages, profusely illustrated with well executed engravings and is bound in paper covers. Interesting features of the opening pages are a bird's-eye view of the company's works and a *fac-simile* of the guarantee bond which the manufacturers give with their goods. Since the last edition of the catalogue was issued the company have added several cast ranges and cook stoves, and have improved and brought up to date their old favorites. Some directions for setting up and operating stoves are given, also a few words about chimneys. In the way of steel ranges the company present the Gloria, the Damascus, the Steel Clad and the Nickel Plate, all of which are made of "secret process" hammer steel, which is said to be always bright and never has to be blackened. All inside plates are of heavy range steel, securely riveted, and the oven bottom plates are of triple thickness, so that they will not buckle. The external treatment of these ranges is very effective, the nickel plated portions forming sharp contrasts to the black surfaces, which are embellished with more or less cast ornamentation. A new steel cook stove to which attention is invited is the Fashion, intended for using coal or wood. It is a four-hole construction and embodies the latest features. Among the cast goods may be mentioned the Perfect Kitchen Queen, the Crown, the La Belle, the La Grande, the Windsor, the Kitchen Queen, for wood only, the New Dexter, the Indianola and the Monon. The lines of hot plates are offered under the names of Lawrence, made in three styles, and Junior, made in two styles.

THE WHITING FOUNDRY EQUIPMENT COMPANY, Harvey, Ill., have booked an order from Manchester, England, for a complete foundry equipment.

DEATH OF WILLIAM H. SHICK.

In the death of William H. Shick of the Reading Stove Works, Orr, Painter & Co., Reading, Pa., which occurred on February 20, after an illness of several weeks, the Pennsylvania stove trade loses one of its oldest and most prominent representatives. Mr. Shick was born at St. Mary's, Chester County, Pa., on February 22, 1835, and at the age of 17 went to Milton, Pa., where he learned the stove molders' trade. He afterward moved to Philadelphia and was employed in a number of stove works in that city until the outbreak of the Civil War, when he enlisted in the Seventy-second Pennsylvania Volunteers, and served for three years. At the battle of the Wilderness he was wounded and captured, spending some time in Libby Prison. After a captivity of several months he was exchanged and soon after honorably discharged from active service. At the close of the war Mr. Shick went to Reading and assisted in the organization of the Reading Stove Works, with which he was connected up to the time of his death. He was a member of the Board of Directors of the company from their organization.

Mr. Shick was prominent in the Methodist Church, and at the time of his death was a member of the Board of Trustees of the Church of the Holy Cross, Reading. He conducted a Sunday school class in connection with the church. He was also connected with a number of charitable and philanthropic institutions. Mr. Shick is survived by his wife, three sons and a daughter. The funeral services were held by the Rev. Dr. Shanklin, at the Church of the Holy Cross, Reading, on Monday, February 24, and were attended by a large delegation from the stove works and many others.

At the annual meeting of the stockholders of the Reading Stove Works, held on the evening of February 20, at the office of the company, the following tribute to the memory of the deceased was adopted:

The death of William H. Shick, announced to the stockholders while in meeting assembled this 20th day of February, 1902, though somewhat expected, has come as a shock to all his business associates and friends. One of the original members of the firm of Orr, Painter & Co., he has been associated with the firm and the corporation up to the time of his death. No one was more devoted or faithful to the interests of the institution he helped to create and aided so largely to develop. His experience in the foundry and on the road made him a very helpful and useful member of its management. His rich abundance of good nature made him beloved by all who came in contact with him. His sturdy Christian character manifested itself in his whole life, business as well as social. His loss will be felt not only by the stockholders but by all the workingmen and officers and directors of the company. His life was full of charitable works in our community.

We, the stockholders of this company, shall miss his cheerful companionship and wise counsel at our meetings, none of which he failed to attend since its organization.

We wish, therefore, to record our high appreciation of the sterling worth, integrity and noble qualities of our departed friend and associate and to tender to his family our sincerest sympathy in their great loss.

We reverently hope that the Father of all mercies and healer of all sorrows will grant them His comfort and consolation in this sad hour.

ODD PLATES.

The Pioneer Stove Company of Columbus, Ohio, are distributing among their friends in the trade a 48-page catalogue, illustrating and describing their leading lines of specialties in the way of Cook Stoves and Heaters. The variety is such as to meet many requirements, and the goods are equipped with the modern improvements. Steel Ranges are included in the assortment, as are also Gasoline Stoves and Ovens, Heaters and miscellaneous goods. The company were established in 1826, and were incorporated in 1901.

George M. Clark & Co., Chicago, have issued a dainty catalogue treating of Stoves for summer service. The catalogue treats of the Jewel gasoline construction. The Stove shown is the Jewel Smokeless Generator Range, which is illustrated in a variety of styles, showing its adaptation to varied requirements. The publication also gives a number of approved recipes for breakfast, lunch and dinner dishes, soups, salads, puddings, &c.

Rasmus Nielsen, manager of the Ida Hill Nickel Works, and Leonard H. Giles, representing the Giles Nickel Works, have formed a copartnership to be known as the Giles-Nielsen Nickel Works, at Troy, N. Y. The new firm represent two concerns well known among the Stove manufacturers and whose prestige and popularity were long ago established for good workmanship. They have leased the old Coutie machine shop in Front street and have made many changes. They are in a position, with increased facilities, to turn out the best kind of work in Nickel, Copper and Brass Plating.

At the annual meeting of the stockholders of the Reading Stove Works, Orr, Painter & Co., held at the office of the company in Reading, Pa., on February 20, the following were elected as directors for the ensuing year: Edgar Amole, Frank L. Connard, William H. Luden, W. Harry Orr, Jesse Posey, Robert P. Shick and Charles H. Williamson. Upon reorganizing, the board elected W. Harry Orr president, Edgar Amole treasurer and William S. Essick secretary.

The National Stove & Illuminating Company, Cleveland, Ohio, have placed on the market an Acetylene Stove which they claim thoroughly overcomes all the obstacles that have been experienced in the use of acetylene gas in a cooking apparatus in the past.

The H. E. Hessler Company, Syracuse, N. Y., are sending out the spring edition of their "Stove Repair and Tin Shop Supplier," which consists of 82 pages, with a well arranged index devoted to Stove Repairs, Stove Shakers, Furnace Repairs, Water Fronts and Stove Linings. The catalogue also shows cuts of many of the different supplies required by the Stove dealer and tinsmith, including Stove Bolts, Rivets, Fire Shovels, Pokers, Stove Urns and Knobs, Dampers, Registers, Check Drafts, Furnace Pipe and Fittings, Tin Plate, Sheet Iron and Zinc, Eave Trough, Elbows and a line of Plumbers' Goods, Iron Goods and Fire Pots, with a great variety of Tools. The latter portion of the catalogue is devoted to Coal Hods, Hollow Ware, Lanterns, Refrigerators, Gasoline and Oil Stoves, Paints, Enameled Ware, Tinware and House Furnishing Goods with Hardware and Cutlery.

Capt. James A. Fenn, superintendent of the Stove foundry of Rathbone, Sard & Co., at Aurora, Ill., has retired from business and has been succeeded in the superintendency by Oliver White of Albany, N. Y. Captain Venn has had charge of the Aurora plant since its erection 12 years ago. His retirement is a matter of regret to all connected with the concern. He has large real estate interests in Detroit, Mich., and proposes to make his home in that city. Prior to his departure from Aurora Captain Venn was presented with a handsome gold watch and chain by the employees of the works as a token of their esteem.

The Lizzie Lowman Stove Works, Sheffield, Ala., are reported to be running to their full capacity, with a large number of orders on their books. The concern have just received orders for 14 carloads of Stoves for immediate shipment, ten of which are to go to Shreveport, La., and four to Little Rock, Ark. They shipped three carloads of Stoves recently to California.

The Peninsular Stove Company, Detroit, Mich., are erecting a six-story addition to their establishment on Fore street at a cost of $42,000.

A dispatch from La Crosse, Wis., states that Chicago parties are negotiating for the establishment of a large Stove foundry in that city. It is stated that the promoters are not asking for a bonus, but only require the provision of a site for the proposed plant.

The Foster Stove Company, Ironton, Ohio, are erecting a new and enlarged plating room in connection with their works for the accommodation of their nickel plating plant. The building will have a concrete floor and be provided with a 25 horse-power engine and all the equipments of a modern nickel plating plant. The building now being used as a plating department will be adapted to the manufacture of Steel Ranges.

The Memphis, Tenn., *Scimitar* is authority for the statement that the H. Wetter Mfg. Company of that city, whose large Stove plant was recently destroyed by fire, are considering the advisability of building their new plant in some other location. The concern are reported to have received a number of tempting

inducements to locate in other parts of the South, and a general meeting of the stockholders will be called as soon as the insurance on the burned plant is settled, when plans for the future will be decided upon.

J. S. GRAHAM, secretary of the Pittsburgh Stove & Range Company, is credited with the statement that plans have been completed for a new plant, to be erected by the concern at Beaver Falls, Pa., to cover nearly 23 acres of ground and cost over $300,000. Between 800 and 1000 men will be employed. The output will consist of Gas Ranges, Furnaces, Cooking Stoves and Ornamental Grates for coal and gas.

MINNESOTA RETAIL HARDWARE ASSOCIATION.

That the hardware merchants of Minnesota show a high degree of interest in their State organization was manifested by the large attendance at their sixth annual meeting, held in the Ryan Building, St. Paul, on February 26, 27 and 28. The Minnesota Association is probably stronger, numerically at least, than any other similar organization, having a present membership in excess of 500 out of a total of 800 legitimate hardware dealers in the State. This is a handsome percentage, and the officers of the association are to be congratulated on the splendid result of their work.

The first session of the convention was called to order on Wednesday afternoon by President W. H. Tomlinson of Le Sueur. Mayor R. A. Smith of St. Paul welcomed the convention to the city and was replied to by A. T. Stebbins of Rochester, who thanked the Mayor for his cordial greetings. President Tomlinson read his annual address, which contained a number of interesting statements, and showed the association to be in a highly prosperous condition. J. F. McGuire of St. Paul, who was next called upon, indorsed the welcome given by the Mayor and offered to the delegates to the convention the free use of the quarters in the Builders' Exchange of the St. Paul Retail Hardware Dealers' and Sheet Metal Workers' Association. J. C. Nolting of St. Paul, president of the local association, seconded Mr. McGuire's words.

The appointment of the following committees was announced:

INSURANCE: A. C. Hatch, Battle Lake; Knute Hansen, Battle Lake; Julius Schmidt, Wabasha; O. F. Olson, Brandon; A. E. Anderson, Rothsay.
PRESS: J. F. McGuire, St. Paul; C. Schroeder, Mankato; J. P. Watson, Rochester.
GRIEVANCES: E. H. Heins, Renville; C. V. Ferguson, Chatfield; P. H. Caley, Princeton.
RESOLUTIONS: A. C. Stebbins, Rochester; C. F. Ladner, St. Cloud; J. C. Nolting, St. Paul.

Secretary Thomas McCracken of Minneapolis then read his report, which showed a gain during the year of 72 new members. The report of Treasurer G. M. Evenson of St. Peter showed a satisfactory financial condition.

C. F. Ladner moved that an auditing committee be appointed, which was adopted. The president appointed the following: C. F. Ladner, St. Cloud; A. Mengh, Princeton; Geo. F. Derry, Plainview. On motion of A. C. Stebbins a telegram of condolence was ordered to be sent to Ex-President James E. O'Brien of Crookston, who was prevented by illness from being present.

The session on Thursday morning was devoted to a discussion of a number of interesting trade matters, and C. L. Sulerud of Halsted and T. H. Caley of Princeton gave brief addresses.

C. Schroeder of Mankato, for the Committee on Nominations, reported the following list of officers for the ensuing year:

PRESIDENT, W. H. Tomlinson, Le Sueur.
VICE-PRESIDENT, H. S. Cleveland, Minneapolis.
EXECUTIVE COMMITTEE: Three years, P. J. McGuire, St. Paul; A. T. Stebbins, Rochester; Charles F. Ladner, St. Cloud, succeeding C. F. Stremel, Minneapolis; S. R. Nelson, Owatonna, and C. F. Ladner.

The secretary and treasurer are appointed by the Executive Committee, which accounts for the omission of these offices from the list.

On motion of P. L. Norman of Monticello the committee's report was adopted and the secretary was instructed to cast one ballot for the nominees, who were declared elected. President Tomlinson thanked the convention for the honor of a re-election. The department store question was treated in talks by J. F. McGuire of St. Paul and T. H. Caley of Princeton and others.

On Thursday afternoon A. C. Hatch, president of the National Hardware Dealers' Fire Insurance Company read his report for the year. Secretary McCracken supplemented the report by stating that in January $50,000 insurance had been written and $1300 received for premiums, and up to February 22 $87,000 insurance had been written and $2700 received for premiums, with enough applications on hand to be written up to run February over $100,000, which would make it the largest month the company have ever had. No losses have been suffered in these months. It is expected that March will be still heavier.

P. W. Lyon of Janney, Semple, Hill & Co. of Minneapolis gave an address on "The Three Essentials," which he explained as being the manufacturer, the jobber and retailer in their relations to one another. M. De Motte of St. Paul read an interesting paper on "How to Write an Advertisement." Charles F. Ladner of St. Cloud reported that the committee appointed last year to consider the advisability of joining the National Association recommended favorable action in that direction. The report was adopted unanimously.

The convention then went into executive session and a lively discussion ensued relative to trade practices which interfered with the interests of the retail dealers. Announcement was made that the Executive Committee had elected W. A. Barto of Long Prairie treasurer for the ensuing year. A motion was passed authorizing the Executive Committee and secretray to print a list of manufacturers and jobbers regarded as favorable to the association.

Julius Schmidt of Wabash stated that he had been requested to bring before the association the fact that many hardware dealers in Western Wisconsin desired to join the Minnesota Association, because they were so far from the regular meeting place of the Wisconsin Association as to make it inconvenient for them to attend the conventions in that State. He therefore moved that this be permitted in case the Wisconsin Association did not object. An amendment was made to include dealers from other States if they desired membership. The motion as amended was adopted.

On Friday morning G. L. Nye of the Minnesota Stove Company was invited to address the convention. He touched on the importance of marking goods high enough so as to be sure of including all fixed charges, then adverted to co-operative buying, which he approved if a practical method could be devised for the purpose. A resolution to the effect that the hardware traveling men of Minnesota be permitted to become members of the retail hardware association was adopted. It was decided to hold the next annual meeting in Minneapolis.

At the meeting of the Executive Committee on Friday afternoon W. H. Tomlinson and Charles F. Ladner were selected as delegates to the National Association, with the privilege of naming a third delegate. Thomas McCracken of Minneapolis was re-elected secretary for the ensuing year.

The annual banquet, which was held on Thursday evening at the Hotel Ryan, was attended by about 300 guests. J. F. McGuire acted as toastmaster, proving himself admirably fitted for this exacting position. Those who spoke were: President W. H. Tomlinson, Charles F. Ladner, W. A. Barto, R. A. Kirk, president of the National Hardware Association; George W. Cope of *The Metal Worker;* H. S. Cleveland, A. T. Stebbins, H. O. Spencer, H. P. Hall and Jesse A. Gregg.

The following were observed in attendance on one or more of the sessions of the convention:

L. W. DeVault, G. J. Clefton, S. A. Clefton and O. R. Manners, of the Western Supply Company, St. Paul.
W. H. Gruenhagen and C. S. Chatfield, Eclipse Stoves and Ranges, Minneapolis.
Samuel C. Silverman, St. Paul Stove Repair Works, St. Paul.
H. L. Chaffee, Simmons Hardware Company, St. Louis, Mo.

Paul R. Seidel, Geuder & Paeschke Mfg. Company, Milwaukee, Wis.
E. B. Waterman and T. J. Duffy, Jr., Black & Germer, Erie, Pa., and Chicago.
G. M. Gates, Thomas White Stove Company, Quincy, Ill.
J. W. Walker, Detroit Stove Works, Detroit and Chicago.
W. C. Sibley, the Malleable Steel Range Company, South Bend, Ind.
M. Ledwidge, Follansbee Bros. Company, Pittsburgh, Pa.
B. W. Cavell, the Art Stove Company, Detroit, Mich.
A. S. Dean, the Michigan Stove Company, Detroit and Chicago.
Theo. Schemmer, Lalance & Grosjean Mfg. Company, New York.
Charles H. Conner, the Fuller Warren Company, Milwaukee, Wis.
J. W. Torrence, Wm. Resor & Co., Cincinnati.
Charles Lindemann, J. P. Lindemann & Sons, Milwaukee, Wis.
Geo. W. Cope and H. H. Roberts, *The Metal Worker*.

KENTUCKY RETAIL HARDWARE AND STOVE DEALERS' ASSOCIATION.

The second annual meeting of the Kentucky Retail Hardware Dealers' Association was held in Liederkranz Hall, Louisville, on February 25 and 26, with a good attendance of members. The convention was called to order by President George P. Dehler, Jr., who gave his annual address. Mr. Dehler was followed by Secretary Paul Wagner, who read his report for the year, showing a total membership of 52, representing 15 towns in the State.

After the reports of standing committees had been rendered an address was made by W. P. Lewis of New Albany, Ind., president of the National Retail Hardware Association, who gave an account of the working of the national body.

The following committees were appointed by the president:

COMMITTEE ON RESOLUTIONS: W. P. Oldham, Mt. Sterling; J. L. Malin, Vine Grove; U. S. Shacklett, Fulton.
COMMITTEE ON NOMINATIONS: Kee R. McKee, Cadiz; Jos. Knapp, Louisville; Jno. C. Frederick, Owensboro; Geo. B. Minary, Versailles; J. W. Mahan, Lawrenceburg.

The Question Box brought out a number of interesting questions, among the more important ones being the following:

Should the legitimate dealer handle seconds?
Should a retailer advertise prices?
What is the best way to fight the steel range peddler?
Is it advisable to mark prices plainly?

Those taking part in the debates were: Kee R. McKee, U. S. Shacklett, J. H. Mahan, Ed. Steitler, Jr., P. C. Sower, J. C. Frederick, Jos. Kirchdorfer, J. M. Stone J. L. Malin, J. S. Ogden and Samuel Korb.

T. James Fernley, secretary-treasurer of the National Hardware Association, made an interesting address, which was listened to by the members with the closest attention and was awarded a rising vote of thanks.

The following persons were proposed by the Nominating Committee as officers for the ensuing year:

W. P. OLDHAM, Mt. Sterling, president.
J. L. MALIN, Vine Grove, first vice-president.
U. S. SHACKLETT, Fulton, second vice-president..
PAUL WAGNER, Louisville, secretary.
JOS. C. KIRCHDORFER, Louisville, assistant secretary.
HENRY HEICK, Louisville, treasurer.

They were unanimously elected.

The delegates selected to attend the meeting of the National Retail Hardware Dealers' Association, at Chicago, on March 19, 20, were Jno. C. Frederick, Owensboro, and Paul Wagner, Louisville, the alternates being J. L. Malin, Vine Grove; J. F. Van Deren, Lexington, and Jos. C. Kirchdorfer of Louisville.

J. L. Malin of Vine Grove read a paper on "Why a Dealer Should Join His State Association," and an address was made by Samuel B. Korb of the Louisville Retail Hardware and Stove Dealers' Association. Louisville was selected as the place of the next meeting, which is to be held in February, 1903, the particular dates being left to the Executive Committee.

On the evening of the 25th a very enjoyable smoker and Dutch supper was tendered the State association by the Louisville Retail Hardware and Stove Dealers' Association. Terstegge, Gohmann & Co., stove manufacturers, of New Albany, Ind., took advantage of the occasion and presented every one present with a souvenir in the shape of a small skillet, nicely finished and nickel plated.

Another social feature was a theater party, given to the members and their wives by the jobbing firm of W. B. Belknap & Co. Eighty-one persons took advantage of the invitation and went to Macauley's in a body. The occasion was a most enjoyable one, and the hospitality of this well-known house was thoroughly appreciated.

Among the manufacturers and jobbers represented at the convention were: Follansbee Brothers of Pittsburgh, Pa.; Terstegge, Gohmann & Co. of New Albany, Ind., and Bridgeford & Co., J. M. Robinson & Co., B. F. Avery & Sons, and Stratton & Terstegge of Louisville.

IOWA RETAIL HARDWARE DEALERS' ASSOCIATION.

The fourth annual convention of the Iowa Retail Hardware Dealers' Association was held in the Young Men's Christian Association Hall, Cedar Rapids, on March 4, 5 and 6. The attendance was not as large as at last year's convention at Dubuque, which was attributed to the fact that the annual convention had been postponed and the place of meeting changed, as noted in our last issue. The president, W. A. McIntire of Ottumwa, addressed the convention, expressing his gratification at the attendance and welcoming the delegates. W. H. Keating of Ottumwa then read his report as secretary, and George Lister of Manchester, his report as treasurer.

The following Reception Committee was appointed: Geo. E. Staehle, Earlville; L. Lindenburg, Dubuque; Jacob Seither, Keokuk, and A. C. Veitch, Oakland. Traveling men were called on for addresses, and T. C. Burdick of the Janesville Barb Wire Company, Janesville, Wis., made an entertaining talk.

The Question Box was then opened and several questions were discussed, among them being the following:

What is your experience in early closing, say at 6.30?

Numerous members answered, representing cities in different parts of the State, unanimously expressing satisfaction with the adoption of early closing hours and stating that they would never return to the old custom of keeping open until late at night, excepting on Saturday and a week or so before the Christmas holidays.

Is it an advantage to divide your trade with every house calling on you?

The discussion which this brought out was also one sided. The members speaking all thought it best to buy largely from one house, thus securing greater appreciation of the orders sent in, which will lead to greater interest by the house thus favored. The point was made that in stoves particularly one full line should be carried at least to meet the wishes of customers who desire a variety of sizes.

Is paint a profitable and satisfactory line to handle in connection with hardware?

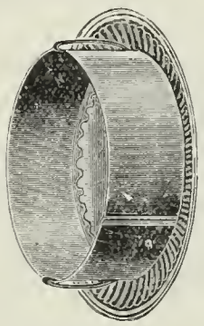
Several members gave their experience in handling paint, all of them being favorable.

On Wednesday, H. A. Cole of Council Bluffs and C. R. Keating of Mt. Ayr read papers on "The Benefits of Organization," and S. R. Miles of Mason City one on "Credits." Other papers which were read and discussed during the meeting were one by George S. Staehle of Earlville on "Trusts in Their Relation to the Retail Dealer," and another by L. Lindenburg of Dubuque on "Our Competitors." The Commercial Club of Cedar Rapids entertained the delegates to the convention in the club rooms on Wednesday evening.

EUREKA REFRIGERATOR COMPANY, Indianapolis, Ind., have issued a catalogue of their high grade Refrigerators. These goods are illustrated in five regular stock sizes and in two different styles. These are opal enamel inside and outside, with oak cases and opal enamel lining.

Common Sense Flue Stop.

The Common Sense flue stop, an illustration of which is presented herewith, is manufactured by J. K. Schick, Fairbury, Ill. The advantages claimed for this flue stop, which has been patented by the manufacturer, are its simplicity, durability and ease of adjustment. It is



Common Sense Flue Stop.

claimed to be absolutely soot proof and a favorite with dealers on account of its ready sale. Mr. Schick has received a number of testimonials from users of this flue stop, and is prepared to send circulars and prices to any one who is interested.

Stove and Hardware Dealers.

W. H. Boutell & Co., Rochester, N. Y., have been succeeded by Boutell Mfg. Company, who will continue the manufacture of Apple Parers, Slicers, Choppers, &c., as heretofore.

C. B. Smith has succeeded J. H. Markel in the Hardware, Agricultural Implement, Stove, Furnace, Tinware, Plumbing, Glass, Paint, crockery and seed business, at Shrewsbury, Pa., and will be pleased to receive catalogues and price-lists relating to these lines.

W. R. Becker has disposed of his interest in the firm of Smith & Becker, Camden, N. Y., to L. P. Smith, his former partner, and has formed a new partnership with Conrad Klett, also of Camden, under the firm style of Becker & Klett, and will open a new store with practically the same line at 89 Main street, as soon as necessary repairs can be made to the store, which repairs will probably not be completed much before April 1. Becker & Klett will do a cash business as nearly as possible, and will pay spot cash for all goods purchased. The new firm will be glad to receive catalogues and quotations pertaining to Hardware, Stoves, Tinware, Sporting Goods, Agricultural Implements, Paints and Oils, Harness, plumbing and steam fitting goods, &c.

C. F. Flude has disposed of his Hardware and Stove business in Anthon, Iowa, to Hall & Brunnell.

The Milwaukee Wood Preserving Company, 804 Third street, Milwaukee, Wis., represented by J. Kornely, are offering to the trade a Wood Preserving Paint which is named Presser's Preservatine. This Paint is the original Carbonlineum. It is a German Paint which has been in use over 20 years, and has been very successfully introduced in this country. The manufacturers state that it is an antiseptic impregnant and covering, and is particularly valuable for the preservation of wood and for keeping dry and sweet stone or brick walls that are subject to damp and moisture. The manufacturers claim that wood treated with this Paint, whether below or above ground, whether in or out of water, will neither rot nor decay, the surface becoming almost as hard as stone. Preservatine gives wood a fine brown color, remains liquid for years, and is always ready for immediate use.

Those who have occasion to equip a bakery with an up to date oven and apparatus for handling the baking will be interested in a circular issued by Pembroke D. Harton, Philadelphia, Pa., which shows a general view of the oven and also a sectional view of the oven's baking wheel. The wheel revolves intermittently, bringing the shelves to the opening long enough for the baking to be removed and a fresh baking to be inserted.

Diamond Stamped Ware Company, Detroit, Mich., announce that W. S. Canright has been appointed secretary and manager of the company, vice C. D. Milne, who has resigned the position.

D. N. Clark, Shelton, Conn., recently filled one of his large show windows full of Universal Meat Cutters marked at 88 cents each. In ten days all in the window were sold with the exception of three machines. Mr. Clark says that the quantity of goods shown and the low price that was clearly marked brought the business.

The American Wringer Company, 99 Chambers street, New York, have just issued a complete general catalogue of 88 pages, illustrating and describing in detail the great variety of Horse Shoe Brand Clothes Wringers, Mop Wringers, Clothes Mangles, Toy Wringers, Clothes Dryers, Folding Benches for Wash Tubs and the different goods of their comprehensive line. The illustrations are printed in various tints, and the book has an illuminated cover. Particular attention is called to the ball bearing features and the quality of the rubber used in the rolls. The catalogue is an exceptionally complete one, and very artistic and attractive, and accompanied as it is with a new price-list of net prices on case lots, will be regarded with especial interest by the trade.

Francis R. Hope, New Egypt, N. J., presents a very pretty embossed card in red, white and blue, with a design on the front cover showing a sunburst, which calls attention to the fact that he handles the Sunshine Stoves and Ranges made by Orr, Painter & Co., Reading, Pa. He also makes a specialty of plumbing, steam and hot water heating and general tinsmithing work.

The Magnet Cement & Dressing Company, Philadelphia, Pa., have made John H. Graham & Co., 113 Chambers street, New York City, selling agents for their Rock Cement. This is a preparation for mending china, glass, crockery, stone, marble, metal, wood and bric-a-brac, and which is impervious to hot and cold water and dampness. It is put up in bottles to retail at 10 cents each, one dozen on an illuminated easel card to hang or stand, each of which is packed in a neat box, and 12 boxes, or 1 gross, in a case for shipment, the weight of which is 35 pounds.

George S. Battell, secretary and treasurer of the Zahner & Battell Mfg. Company of Kansas City, Mo., died suddenly last week from heart failure at the age of 46 years. He was born at Mendon, Ill., and there learned the tinsmiths' trade. In 1880 he went to Kansas City and entered the employ of W. E. Zahner in the Hardware and Tinware business. Three years later he was taken into partnership, and the concern were subsequently incorporated as the Zahner & Battell Mfg. Company.

The Western Windmill & Hardware Company of Midland, Tenn., have been incorporated with a capital stock of $60,000 by T. J. Martin, George Cowden and E. J. Mumford.

The warehouse of Eli Sieger, dealer in Stoves and Tinware, at Coplay, Pa., was destroyed by fire last week. The loss, which amounted to about $3000, was covered by insurance.

Thomas Briggs of West Manchester, N. H., has decided to sell out his Stove and Tinware business.

It is reported that a consolidation is being arranged with a number of prominent concerns who manufacture Woven Wire Products, such as Baskets, Kitchen Utensils, &c. The new corporation, it is said, will have a capital stock of $8,000,000. Capitalists connected with the United States Steel Corporation are said to be interested in the proposed new consolidation.

Prentice & Jones are a new firm who have started business in the retail Hardware, Tinware and Stove lines, at Newark Valley, N. Y.

John H. Carnes of the Joseph Dixon Crucible Company, Jersey City, N. J., died on February 28 at his home in that city, aged 68 years. He was prominent in the public life of the city, and had served as president of the Board of Fire Commissioners and as a member of the Jersey City Board of Finance.

A TIMELY HINT FOR ROOFERS.

The heavy storms of snow, rain and sleet which the past few weeks have brought will be a good test for all roofing work. A roof that will not leak under the recent conditions is as tight as it can be made. There are sure to be many roofs, however, which will show leaks as soon as thawing begins. Then the defective places should be marked, so that they can be easily found when the weather is favorable for repair work. The same thing applies to gutters and spouting. If after a snow storm the conductor is cleared of snow at the point of connection with the roof the danger of the tube freezing is lessened. Where there is no sewer connection the elbow at the bottom of the leader should be kept clear to avoid the choking of the leader, which would naturally fill with ice, expand and probably burst the seams of the pipe. This is more apt to occur in a plain leader than a corrugated one, because the corrugations allow for the expansion of the ice. A little foresight in this matter may save a great deal of expense and trouble.

WHAT SHOULD A TINSMITH KNOW?

BY W. A. F.

The questions recently asked and answered in *The Metal Worker* as to what a cornice maker and what a furnaceman should know naturally give rise to another question—viz., "What should a tinsmith know?" To judge from some of the advertisements frequently seen for tinsmiths one would certainly think it easier to tell what he should not know. In most lines of human endeavor this is an age of specialists, but the tinsmith, apparently, is expected to be a specialist in his and every other line.

As a first requisite the average employer wants a young man; next, he must have had a certain number of years' experience in each of from three to a dozen different trades. How any man can yet remain young after such an expenditure of time is an unsolved mystery, but the tinsmith is expected to do it, along with other things almost as difficult. If a young man is unusually bright and has the opportunity he may be able to acquire a good working knowledge of more than one trade, but life is too short for the average man to become proficient in more than one. It is proverbial that "a jack-of-all-trades is master of none." Versatility may have its uses, but the versatile man is not the one usually selected for special work.

What a tinsmith should know depends very much upon where he is located. If in the country, he will have to do more or less work which in cities and large towns falls to the lot of the plumber, the steam fitter and other mechanics. But no matter where located, an "all round tinsmith," as the advertisements generally read, means just what it says. He is expected to do any and every thing that comes along. What he really should know is his own trade first. That is, he should be able to cut patterns and make up almost anything that can be made of tin or sheet metal. After that, if he has the opportunity to acquire a smattering of other trades it is, of course, to his advantage to do so. But it is not reasonable to expect him to be an expert in more than one.

Peden Iron & Steel Company.

The partnership of Peden & Co. of Houston, Texas, composed of D. D. Peden, E. A. Peden and D. D. Peden, Jr., was dissolved on February 17 and the business transferred to a corporation under the title of Peden Iron & Steel Company, with an authorized capital of $250,000, who will carry on the business of the old firm under the same management as heretofore. The officers of the new company are D. D. Peden, president; E. A. Peden, vice-president and general manager, and D. D. Peden, Jr., secretary and treasurer. The business of Peden & Co. was established in 1890. Their sales last year were about $1,000,000. They employ eight travelling men and a large office and warehouse force. The business operations of the concern cover a wide territory, and they carry one of the largest and best assorted stocks of goods in the Southwest. The principal lines handled by the company are black and galvanized sheets, tin plates, roofing materials of all kinds, tinners' supplies, mill supplies, stoves, hardware, belting, pipe, fittings, valves, nails, wire, tools, light machinery and kindred goods.

Death of Charles A. Vaile.

Charles Albert Vaile of the firm of Vaile & Young of 216 North Calvert street, Baltimore, Md., died on February 24, at his residence, 1627 St. Paul street, Baltimore, of lung disease, from which he had been a sufferer for some years past. Mr. Vaile was a native of Richmond, Ind., where he was born 63 years ago. At the outbreak of the Civil War he assisted in raising a regiment of volunteers, in which he was commissioned lieutenant, serving throughout the war. During the years 1872 and 1873 he was employed as superintendent of the large sheet metal works of George Dwight, Jr., in Springfield, Mass., and for the three following years



CHARLES A. VAILE.

he was in business for himself in Worcester, Mass. In 1877 he went to Baltimore as superintendent for James Geddis, in which capacity he continued for several years. Upon the death of Mr. Geddis he formed a partnership with Louis F. Young, under the name of Vaile & Young, and continued the skylight and sheet metal business of Mr. Geddis on North street for a number of years. Subsequently the extension of the firm's business necessitated a larger shop and they moved to the present location in Calvert street, where they erected a large four-story building, using the basement for storage, the first floor for the office and cornice department, the second floor for the manufacture of skylights, and the third floor as a tin and jobbing shop, the fourth floor being used for the ventilating department. Mr. Vaile was the inventor of the well-known Vaile and Young skylight. He also superintended many large ventilating jobs during the 38 years he spent at the business. He was a frequent contributor to the trade journals and a recognized authority on sheet metal work. Mr. Vaile married Miss Eva Barnes, who, with one brother, John Vaile, survives him. He was a member of the Grand Army of the Republic and the Loyal Legion, and was also a vestryman of the Protestant Episcopal Church of the Messiah, in Baltimore, at which church his funeral services were held on Thursday, February 27. They were conducted by the Revs. Peregrine Wroth and C. Ernest Smith of Baltimore. The interment was made in Loudon Park Cemetery.

At a special meeting of the Board of Directors of the Baltimore Builders' Exchange complimentary resolutions were passed referring to the loss sustained in the death of Mr. Vaile, who was a member of the exchange, and a committee was appointed to attend the funeral.

Puddled Iron Sheets.

Believing that a large demand exists for sheets that excel in lasting qualities and can stand the test of time and weather, the Youngstown Iron, Sheet & Tube Company, Youngstown, Ohio, are sending to the trade throughout the country a little folder calling attention to the puddled iron sheets which they are now producing as a specialty. In this circular the company say: "The fact that roofing and siding made of puddled iron and placed on buildings 15 to 30 years ago is now in a state of perfect preservation, whereas buildings covered with steel sheets four years ago are riddled with holes, proves beyond a possibility of doubt that the lasting quality of puddled iron is many fold greater than that of steel." The company are making double refined puddled iron sheets in gauges 10 to 30, in widths of 44 inches and narrower, and in lengths of 144 inches and shorter. These sheets are furnished black, painted and galvanized, and either flat or corrugated. The concern are also the manufacturers of the New Process galvanized steel sheets, the coating of which is claimed to be of unusual toughness.

American Sheet Steel Company's Extensions.

Plans have been made by the American Sheet Steel Company for large extensions to the Wellsville Works, at Wellsville, Ohio; also the W. Dewees Wood Works, at McKeesport, Pa. Four mills will be added to the Wellsville plant, increasing it from a six to a ten mill plant. The main building also is to be extended about 100 feet and the entire structure will be rebuilt of steel, but this will not interfere with the operation of the plant. Two of the present mills are to be thoroughly modernized. At McKeesport, three mills are to be added, increasing the size of the plant from 13 to 16 mills. When the additions are completed, Persifor F. Smith, the district manager, will have 26 mills under his jurisdiction instead of 19.

The report that it is the intention of the American Sheet Steel Company to erect an open hearth steel plant and sheet mills at Carnegie, near Pittsburgh, is incorrect. Any extensions to existing plants of this concern will probably be made to works located in the Kiskiminetas Valley. A concentration of plants has been made at this place in the last year or two, and the sheet mills formerly located at Carnegie were removed to Vandergrift during the strike of last year.

Origin of Rosin Sized Sheathing or Building Paper.

For the facts contained in this sketch of the origin and growth of the manufacture of rosin sized sheathing paper for building and other kindred purposes, we are indebted to Chapman & Soden, 410-412 Atlantic avenue, Boston, manufacturers of roofing and paving materials, including sheathings and various coal tar products.

Previous to 1871, we are advised, the only papers used for sheathing purposes were tarred and common dry sheathing. So far as water proof properties were concerned, the tarred papers were excellent, but to many the odor was offensive; besides the wearing qualities were not good, as the heat in summer destroyed the life of the paper. The dry sheathing was good as a protection against wind, but would not shed moisture.

Some time during the year 1871 a paper was introduced, called rosin sized cane fiber sheathing. This product was supposed to have all the good qualities of tarred and dry sheathing, as well as being odorless and water proof. The paper was made near Norfolk, Va., from sugar cane, the method of preparation being somewhat peculiar. Having cut the cane into the required lengths the material was placed in an old fashioned muzzle loading cannon and then discharged against a brick wall. This so bruised and crushed the cane that it was easily prepared for the beating engine, and after being run into rolls of about 60 pounds each when dried, was ready for the market.

These goods were made for about three years, but, upon the destruction of the mill by fire, the production ceased, there evidently not being money enough in the venture. After this product was withdrawn from the market, the idea occurred to A. H. Soden of the firm of Chapman & Soden, Boston, Mass., of making rosin sized paper of the same material as used in the manufacture of the dry sheathing, and, by the addition of rosin obtain a water proof odorless sheathing paper, the life of which, unlike the tarred product, would not be destroyed by heat, and which would shed water. This resulted in the introduction of the beaver brand water proof rosin sized sheathing paper, which for a long period was a leading product in this class of goods, and even now is said to have a high position for its water proof quality. From this beginning have sprung, we are advised, the endless brands and qualities of rosin sized sheathing papers.

Carelessness in Slate Roofing.

It is proper to charge to slaters the faults that belong to them, and they are sufficiently numerous, but it is not always through the lack of skill, thoroughness or honesty that roofs fail to perform the function for which they are built. Even with the best intention and the utmost care some hidden fault is liable to come to light, it may be, many months after the work is completed; hence the custom prevails, says a writer in *Cement and Slate*, of requiring the slater to warrant his work for a given length of time.

We have known what appeared to be a most thoroughly laid slate roof to be extensively damaged by means of what was esteemed an excellence of construction. The slates themselves were of the best quality, they were skillfully applied, and the roof boards were sound and well seasoned. "Well seasoned," and therein lay apparently the root of the mischief. Being dry, laid closely and covered with roofing paper, all of which are among the desirable points, no sooner were the upper stories plastered than the under side of the roof boards became swollen by the rising moisture to that degree that the nails were started in many places, and the warping of the boards to which the slates were nailed broke them and let them slide down. In this case the boards curled by the swelling of the under surface. If the boards had been of inferior quality and but partly seasoned it is doubtful whether from this cause they would have warped sufficiently to injure the slates. Ample nailing would perhaps have held the boards to the rafters, but this was not the slater's business, although a good workman ought not to proceed with work knowing it is being done at a disadvantage.

On another roof a similar result followed an opposite cause. The roof boards were but partially seasoned when, late in the fall, they were covered with the roofing paper and then overlaid with slate. There was no trouble until some months afterward, when the house had been plastered, and, by means of thorough ventilation and heating, was thoroughly dry. Then the boards on the roof began to "get their backs up," and loosened the slates by the score. Here the boards curled by the shrinking of the under surface. If they had all been nailed through the middle to every rafter as well as at the edges this might possibly have held them, but few builders would think such thoroughness necessary. It is perhaps needless to say that in both cases the boards were spruce, and, as everybody knows, the old serpent himself is not more stubbornly inclined to warp and twist and crawl than is spruce lumber if it has any provocation or opportunity.

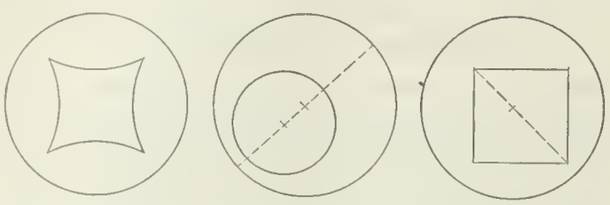
In the former of these two cases the trouble could doubtless have been prevented by providing thorough ventilation while the building contained any moisture, and in the latter by using well seasoned stock, which, it is safe to say, is always best for building purposes.

Obtaining Patterns for Shafts Mitering Upon a Ball.

"J. H. T.," New York City, writes: I should be pleased to have you solve in the columns of *The Metal Worker* the problems shown by the inclosed sketches. Fig. 1 shows the plan of a square shaft with concave sides mitering upon a ball. Fig. 2 shows plan of a round shaft mitering upon a ball, its axis passing to one side of the center of the ball, and Fig. 3 shows the plan of a square shaft similarly placed upon the ball.

In your "New Metal Worker Pattern Book" there is a problem showing a square shaft mitering concentrically upon a ball, but since in Fig. 3 the center of the shaft is to one side of that of the ball, the pattern of each side would be cut with a different radius. I would like to know how to find the different radii.

Answer.—The principles governing the pattern for the sides of the shaft shown in Fig. 1 of our correspondent's sketches are in reality covered in Problem 73



Figs. 1, 2 and 3.—Reproduction from Correspondent's Sketches Showing Shafts of Different Plan Mitering Upon a Ball.

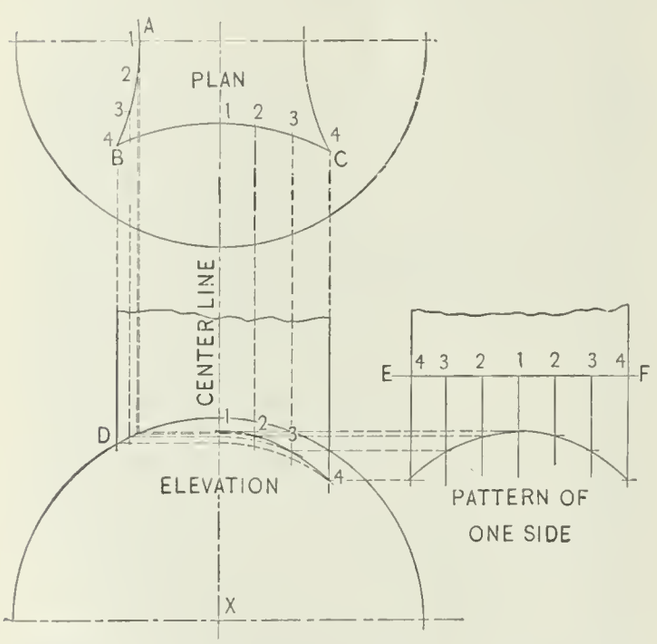


Fig. 4.—Method of Obtaining the Pattern of a Shaft with Concave Sides Mitering Upon a Ball.

of the "New Metal Worker Pattern Book," but as the moldings in the design there shown occupy an inclined position instead of a vertical one, as indicated by the plan in Fig. 1, the application of the method there explained may not be easily made. A simple solution of the problem is shown in Fig. 4. It is first necessary that in either of the demonstrations asked for an elevation be constructed in which the intersection of the shaft with the surface of the ball be shown. Draw first an elevation of the ball, whose center shall be upon the same vertical line as that of the plan, one-half of which only is shown in the figure. Divide one-half of one of the sides of the shaft, as A B in plan, corresponding with that shown in profile in the elevation, into any convenient number of equal spaces; also divide one-half of the front side, B C of the plan, corresponding with that shown in full in the elevation, into the same number of equal spaces, as shown by the small figures. From the points in A B drop lines upon the outline of the ball in elevation, near D, and from the points there obtained carry lines horizontally, cutting the center line of the elevation. Now from the points in B C of the plan drop lines indefinitely across the elevation; then placing one foot of the dividers at X, the center of the ball in elevation, bring the other foot to the several points previously obtained on the center line and draw an arc from each, cutting lines of corresponding numbers drawn from the points in B C. A line traced

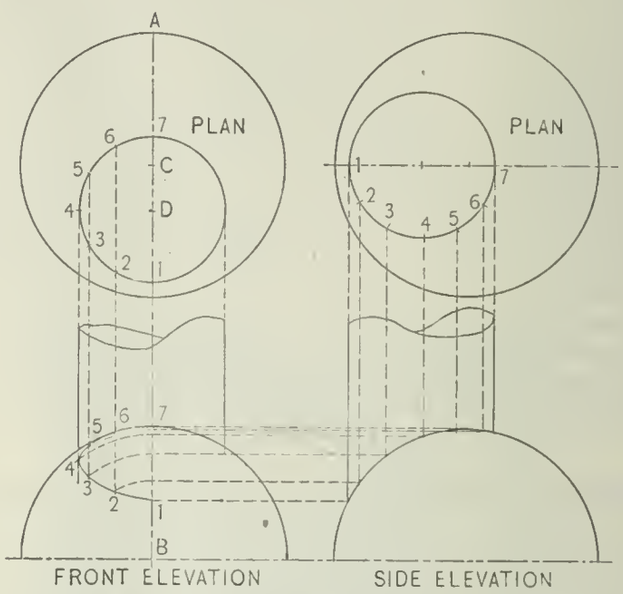


Fig. 5.—Method of Finding Miter Line Between a Round Shaft and a Ball.

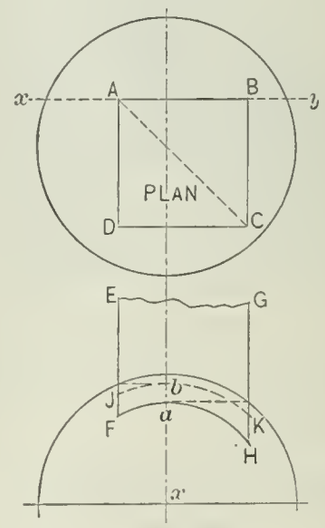


Fig. 6.—Method of Finding the Intersection of a Square Shaft with a Ball.

OBTAINING PATTERNS FOR SHAFTS MITERING UPON A BALL.

through the points of intersection will show one-half the desired intersection or miter line, from which the entire pattern may be obtained.

The method of developing the pattern for one side is fully shown at the right, and as it presents no features not generally understood it will require no further explanation.

The method of obtaining the pattern for the round shaft is shown in Fig. 5. Since the axis of the shaft does not pass through the center of the ball an elevation must first be obtained showing the design as seen in the direction of a line passing through both centers in plan. Therefore first draw the circumference of the ball in plan, and upon a vertical line, A B, passing through its center, C, locate the center of the shaft D, whose distance from C must be equal to the oblique distance between the corresponding points of Fig. 2. Below the

plan and upon the same center line A B construct the front elevation, as in Fig. 4. It will also be necessary to draw a side elevation in line, as shown at the right, which may be projected from another plan so placed as to present its side to view, as showu at the right of the first plan in Fig. 5. The elevation of the miter line or intersection of the shaft with the ball is obtained in the front elevation by first dividing corresponding halves of the shaft in the two plans into the same number of equal spaces, as shown by the small figures. The intersections between the two elevations producing the miter line are obtained in the same manner as between the two halves of the same elvation ln Fig. 4, all of whlch is shown with sufficient clearness in Fig. 5 to require no further explanation. The pattern may be obtained by projections from the numbered points of the front elevatlon in the same manner as that shown in Fig. 4.

In obtaining the patterns for the square shaft shown in Fig. 3 the method described in the problem to which our correspondent refers (Problem 27) is scarcely sufficient. In that problem the face shown in the elevatlon is obtained from one of the outlines, representing a side in profile, because all sides occupy the same relative position with reference to the center of the ball. In the case shown in Fig. 3, since the center of the circle is on one of the diagonals of the square, either two of the sides meeting at one end of that diagonal, as B C and D C, Fig. 6, will be alike and both will be different from the other pair of sides, B A and D A, meeting at the opposite end of the diagonal. Hence the line G H of the elevation may be used ln obtaining the elevation (or pattern) of the front, E F H G, while the line E F may be used in obtaining the pattern of the back, shown by E J K G. Therefore from the intersection of the line G H with the outline of the ball carry a line horizontally, cutting the center line at *a*, and with X *a* as radius describe the arc F H. Then E F H G is the pattern for the two sides represented by D C and C B of the plan. In like manner carry a line from the intersection of E F with the outline of the ball to the center line at *b*, aud with X *b* as radius describe the arc J K, giving the pattern for the sides of A D and A B of the plan.

Should the plan of the shaft be so placed upon the ball that all sides would be different then two elevations would be necessary, so that all sides might be first given in profile as a means of afterward obtaining their elevations or patterns as above described.

To answer our correspondent's final request directly, it may be said that since any plane section of a sphere is a circle the radius for the side of any square shaft cutting the sphere may be found by first extending the line of that side in the plan, as A B, till it cuts both outlines of the sphere at *x* and *y*. Then one-half of *x y* (which is the same as X *b*) will be the radius of the curve to fit against the ball. But ln applying the radius so obtained it is necessary to know the comparative hlght of the two extreme points, as J and K. Otherwise the center from which the arc is struck must be found upon a llne running parallel with the sides of the shaft and at a distance from them equal to the distance of the center line of the plan from A and B.

The Muskingum Valley Steel Company.

At the annual meeting of the stockholders of the Curtis Sheet Steel & Corrugating Company, held in Zanesville, Ohio, last week, the following Board of Directors were elected to serve for the coming year: L. T. Jack, W. L. Kirkland, W. S. Fiscus, James McMahon. W. L. Walker, Geo. S. Phillips and W. S. Horner. By resolution the name of the concern was changed to the Muskingum Valley Steel Company. The Board of Directors met and organized by electing the following officers: L. T. Jack, president; James McMahon, vice-president; W. L. Walker, secretary and treasurer, and W. E. Lloyd, manager. Goff, Horuer & Co., Limited, of Pittsburgh, will represent the company in the market, selling their eutire output of black, corrugated and galvanized sheets. The mill has a large stock of raw material on hand, with orders booked to keep the plant running full up to July.

TIN PLATE WAGE SCALE AGREEMENT.

At a conference which took place on Tuesday and Wednesday of this week between representatives of the American Tin Plate Company and of the Amalgamated Association of Iron, Steel and Tin Workers at the offices of the Tin Plate Company in the Battery Park Building, New York, an agreement was reached which virtually assures the continuance of the existing scale of wages in tin plate mills until July 1, 1903, and obviates the occurrence of a strike or the closing down of the mills this year.

The representatives of the Amalgamated Association were Theodore J. Shaffer, president; John Chappell, vice-president of the New Castle, Pa., brauch of the association; John Quinu, president of the Granite City, Ill., branch; W. G. Price, New Kensington, Pa.; James Saddler, New Castle, Pa.; Edward B. Owen, Martin's Ferry, Ohio; William Freeze, Wheeling, W. Va.; William O'Brieu, Elwood, Ind.; W. J. Williams, Elwood, Ind.; Charles Typper, Niles, Ohio, and John Williams, general secretary-treasurer of the Amalgamated Association. The American Tin Plate Company were represented by W. T. Graham, president, and W. B. Leeds, vice-president in charge of the operating department.

At the close of the conference on Wednesday night the following statement was given out by President Shaffer:

> The American Tin Plate Company, through W. B. Leeds, their first vice-president, asked, before the conferences, that I appoint a committee to meet the representatives of the company. This request being in consonance with our constitution, and similar conferences having taken place with other companies, was complied with. The purpose of the company in calling the conference was to secure, if possible, the uninterrupted operation of their plant during the summer months, when the annual scale is formulated, and means practically a continuous scale. The committee was at first doubtful of its authority to enter into an agreement of this kind, regarding it as the prerogative only of the national convention. Inasmuch, however, as the scale rates offered by the American Tin Plate people are those of the present year and generally satisfactory to our members, and as a precedent has been established in arranging a continuous scale with the Republic Iron & Steel Company, the committee consented, so that there is now an agreement which will prevent the closing of the mills or plant of the American Tin Plate Company, and which will render a strike impossible.

Mr. Shaffer also stated that the matter of recognition and organization of the nonunion mills would be considered at the annual convention of the Amalgamated Association, to be held next month in Wheeling, W. Va., and added: "As a matter of form, this agreement must be ratified by the Amalgamated Association, but there is no doubt that the ratification will be given on the recommendation of the association's regular advisers. The question of wage scale for workers in the so-called 'new process' mills did not come up, but we are ready to take that up at any time."

FLASHINGS.

Gara, McGinley & Co., 23 Seventeenth street, Philadelphia, have prepared a number of circulars in the Spanish language with the object of calling the attention of consumers in Cuba, Porto Rico and Central and South America to their Metal Ceilings, Cornices, Skylights, Roofing Tiles and Architectural Sheet Metal Work generally. The enterprise of the concern in getting up a large amount of advertising matter in Spanish should secure for their goods the attention of the trade in the Latin American countries and our new West Indian possessions. The illustrated circulars are especially attractive, presenting half-tone illustrations of work in the line of Metal Ceilings, Sidings, &c., done by the concern, together with examples in colors of the decorative effects that can be produced in the application of Metal Ceilings and Cornices.

The Conklin Tin Plate & Metal Company, whose incorporation was noted in our last issue, advise us that they will conduct a business both in Atlanta and Savannah, Ga., for the sale of Tin and Terne Plates, Sheet Metals, and Tinners' and Roofers' Supplies generally. The firm are composed of Charles A. Conklin and John M. Goddard.

The Houghton & Buxton Mfg. Company, Worcester

Mass., manufacturers of Steel Stampings, have just completed a large order for Stamped Steel Thread Boards for L. T. Houghton, Worcester, Mass., for shipment to Nagpur, India.

The Marietta Sheet Steel & Tin Company, a new enterprise projected by Laken C. Taylor of Cambridge, Ohio, and others, propose erecting a Sheet Steel and Tin Plate plant upon a site recently secured east of Norwood, an outlying section of Marietta, Ohio. The plant will cost about $150,000.

Frank Brooking & C. L. Hickman are erecting a new Sheet Metal works at Macomb, Ill. The plant will be equipped with modern machinery for the purpose of doing all kinds of work in the Sheet Metal line. Work on the plant will be pushed as fast as possible.

The Berger Mfg. Company of Canton, Ohio, exhibited a fine display of their Classik Metal Ceilings at the annual meeting of the Minnesota Retail Hardware Association last week in St. Paul. The company are leaders in this line and the samples shown represented original designs and varied patterns. Walter E. Voigt was in charge.

The American Tin Plate Company have placed an order with the Bass Foundry & Machine Company of Fort Wayne, Ind., for an engine to be installed in the Laughlin Works at Martin's Ferry, Ohio. The engine will be a cross compound Corliss condensing engine, and will develop 2000 horse-power. The high pressure cylinder will be 28 inches, and the low pressure will be 54 inches, with 60-inch stroke. The engine is to replace an old engine which is to be put out of service on account of being worn out.

The American Steel Company have applied for a charter of incorporation, with offices in the Park Building, Pittsburgh. The new concern will deal in Pig Iron, Steel Billets, Blooms, Slabs, Sheet Bars, &c., and will make a specialty of handling foreign Steel. The concern have already placed a number of contracts for foreign Sheet Bars for delivery in this country. The officers are Eugene S. Reilly, president; P. B. Reilly, vice-president, and M. B. Kelly, secretary and treasurer.

We are officially advised that the report that the Youngstown Iron, Sheet & Tube Company would build mills for rolling Structural Steel is incorrect. This concern will confine themselves to the manufacture of Wire, Iron and Steel Sheets and Pipe, Black and Galvanized. They will make a specialty of double refined puddled Iron Sheets and Pipe.

About April 1 the offices of the Amalgamated Association will be removed from the Bissell Block to the new House Building, Water and Smithfield streets, Pittsburgh.

The Kentucky Iron Roofing & Corrugating Company, Covington, Ky., have been incorporated with a capital stock of $25,000 for the manufacture of Roofing Iron and Siding. The company are erecting a plant, 60 x 200 feet, which will be equipped with latest improved machinery. The machines are being built by George C. Keene & Co. of Cincinnati, Ohio, and will be operated by electricity. It is expected that the plant will be ready for operation by April 1. The incorporators are John C. Droege, treasurer of the Licking Rolling Mill Company; Fred. Macke and J. H. Mersman.

TRADE NOTES.

At a meeting of the Board of Directors of the National Fire Proofing Company, held last week, H. S. Black and A. R. Peacock were elected to fill vacancies on the board, caused by the resignation of J. P. Robbins and C. G. Jones. The new directors represent the interests of the George A. Fuller Company, who became closely identified with the National Fire Proofing Company at their recent organization.

The Pittsburgh Reduction Company have purchased 20 acres of land near the Four Mile crossing, in East St. Louis, Ill., upon which they will erect a factory for the manufacture of Aluminum Wire. The plant will be situated on the Southern Railway, with a connection also with the two belt lines. It will be operated in connection with the company's plants at Niagara Falls and New Kensington, Pa.

"The Story of Human Progress" is the title of an illustrated pamphlet that is being sent out by the Goheen Mfg. Company, Canton, Ohio, in the interest of their Carbonizing Coating, a Paint which is claimed to afford a perfect protection to iron and steel from rust and corrosion. The greater part of the pamphlet is devoted to views of various public and private buildings and other structures on which the Paint has been successfully used, together with *fac-similes* of testimonials from those who have tested the material and found it effective.

C. E. Wenzel Company of Newark, N. J., have been incorporated with a capital of $5000, to manufacture Metal Specialties. The incorporators are C. E. Wenzel, David T. Howell and Francis A. Nott, Jr.

The Robertson Mfg. Company, Buffalo, N. Y., have equipped their factory with modern machinery for the manufacture of a line of hand, foot and power Hero Emery Grinders, also what they claim as the only germ proof Automatic Cleaning Water Filter, made in sizes for homes and public buildings, and other specialties. They will be pleased to receive inquiries from the hardware, plumbing and metal trades, as well as from carpenters and builders.

The Chase Rolling Mill Company, Waterbury, Conn., Brass manufacturers, have increased their capital stock from $500,000 to $800,000.

The American Galvanizing Works, Frank E. J. Pugh, manager, have established works at 1247 Fillmore street, Chicago, corner of Rockwell street, and are prepared to fill orders for galvanized Steel Angles, Flat Bars, Channels, &c. They are also dealers in Galvanized Angles, Bars, Bands, Channels, &c., making a specialty of material for wind mills, and are prepared to make immediate shipment. They have facilities for galvanizing long bars, not to exceed 20 feet. The location of the works enables them to handle their business by rail, saving the expense of cartage.

The Pittsburgh Blue Print Company, 1505 Park Building, Pittsburgh, Pa., are calling the attention of those using large quantities of blue prints to a device which permits of the making of copies of drawings by means of electric light. The device is known as the Cylindrical Electric Copier, and is constructed to meet every requirement that would be made upon it in all its various applications. The frame and angles are of light wrought iron pipe; the base is of iron; the glass in the cylinder is the best plate, and the electric lamp used in connection with the machine is of special design, so constructed as to give uniform intensity of light throughout the process of its operation.

The Graselli Chemical Company, Cleveland, Ohio, have favored us with a copy of an artistically gotten up pamphlet which they are distributing in the interests of their Eureka Soldering Flux. The letterpress of each page is inclosed in an elaborate border in colors. Among the decorations are very striking allegorical representations of the inception of chemistry, the conception of chemistry, the perfection of chemistry, the adaptation of chemistry and the triumph of chemistry. The little publication is of such a strikingly artistic nature as to insure the attention of those to whom it is sent. The company announce that their Eureka Soldering Flux is for sale at their branch offices at 63-65 Wall street, New York City; St. Louis, Mo.; Cincinnati, Ohio; St. Paul, Minn.; Milwaukee, Wis.; Birmingham, Ala., and Baltimore, Md., as well as at their general offices in Cleveland, Ohio. For the convenience of small consumers the company offer Crystal Eureka Soldering Flux in 10-pound cans, which will be shipped by freight or express to any destination.

Dr. Richard Moldenke, secretary of the American Foundrymen's Association, announces that the annual convention of the association for 1902 will be held, on the invitation of the foundrymen of New England, in Boston, Mass., on Tuesday, Wednesday and Thursday, June 17, 18 and 19.

BAD SEWER ARRANGEMENT.

BY J. N. S.

In some small cities or towns where there is no system of sewerage I have found that the general practice of architects has been to locate the cesspool to the rear of any house or building which required one, and consequently the drain pipes would be arranged to run in that direction. The only reason why the cesspool is located to the rear is that it is considered more out of sight there, and in the event of its having to be cleaned it would not be so conspicuous. In some cases no flag stone is placed over the top to show where it is located, but the top of the cesspool is 3 feet under ground, and when it is found necessary to open it digging must be resorted to until it is found. In some instances success attends the very first effort. In placing the opening out of sight it is too often placed out of mind, because its exact location is forgotten when it is necessary to find it.

When cesspools are built it has never seemed to occur to the architect that a sewer might possibly be laid



Bad Sewer Arrangement.

in the street at some later date, otherwise he would have arranged the cesspool in the street in the front of the building. He should also place it where it would be found without any difficulty. A foresighted architect would moreover have planned the piping so as to drain to the front, for the reason that it would be so much easier to connect it to the sewer when it was laid. The cesspool could then be disconnected and filled up with clean earth and the connection with the sewer made. That would be an inexpensive and sanitary disposition of the whole matter. But should the cesspool be at the rear it might mean that the house drain under the ground would have to be dug up and cut out and reconstructed to suit the new requirements. Such an operation would cost money and even though it would be money well spent it should be avoided by the architect who labors for his patron's interest.

I have read an article by an English author treating on this subject, a part of which perhaps would be worth while repeating here. "To cut out the plumbing and drainage of a house," he says, "and reconstruct such work may be a costly affair, but not so costly, perhaps, as to have to take a sea voyage or go to the mountains or sea shore to recruit one's health after a fit of illness caused by not having your work overhauled or put in good condition. It is better to pay a pipe or drain doctor than the grave digger. It is also better to spend some of your money this way than to allow your executors to spend it for you."

Very often this is not done, or it is done in the cheapest manner possible. I have often found it done in this way: The pipe leading from the house to the cesspool in the rear is cut off and the end cemented up. The cesspool is allowed to remain as it was. Then an earthen bend is cemented onto the pipe, and by means of another bend a loop is formed and the pipe is brought around to the side of the house, as shown in the accompanying sketch, and carried alongside of it to the front, where it is run out and connected with the sewer. Terra cotta pipe is used the entire distance, and the grade may not always be what it should, so that, with the loop, it makes a poor job. In my experience with such cases the loop gets stopped up repeatedly, as it is not able to keep itself clean, on account of the long circuitous route the waste water has to travel, which deprives it of any flushing or scouring force. There is no means of rodding it out, consequently it has to be dug up. This means a pile of dirt to be thrown up on the lawn. The pipe must then be tapped and cleaned out and a patch must be placed over the place tapped.

This, in itself, would not be so bad if, when the pipe got stopped up again the same place could be dug up, the old patch removed and the pipe cleaned once more. But it is ten to one that a new hole will have to be put in the pipe the very next time it has to be cleaned. A few operations of this kind and the sewer pipe becomes a thing of patches. But, to make matters worse, this house sewer starts to leak at the joints and the slimy water works its way into the cellar wall near the floor line, where it can be seen quite plainly. Then, possibly, some one in the house is taken sick and the money that is spent for medicine and doctors' bills would more than pay the difference in the cost of having the work done properly in the first instance. Well, the upshot of the whole thing is that it has to be done right anyway, but it would be cheaper to employ a good plumber or drain doctor in the first place.

The Central Supply Company.

The Central Supply Company, Indianapolis, Ind., purchased the business of McElwaine & Richards, wholesale dealers in plumbers' and steam fitters' goods and electrical supplies, in West Maryland street, taking possession of the property February 24, after they had filed articles of incorporation with the Secretary of State. The new company are capitalized for $125,000. The members are Louis C. Huesmann, William K. Smith, Alice A. Smith, Samuel R. Bell and William S. Wilson of Union City, and Raphael Kirshbaum of Indianapolis, who also own the Knapp Supply Company of Union City, engaged in the same line of business. They will continue in business, both in Indianapolis and Union City. Mr. Huesmann will be president and general manager of the company. McElwaine & Richards have been in business in Indianapolis for many years. They have a factory at Noblesville, which they will continue to operate.

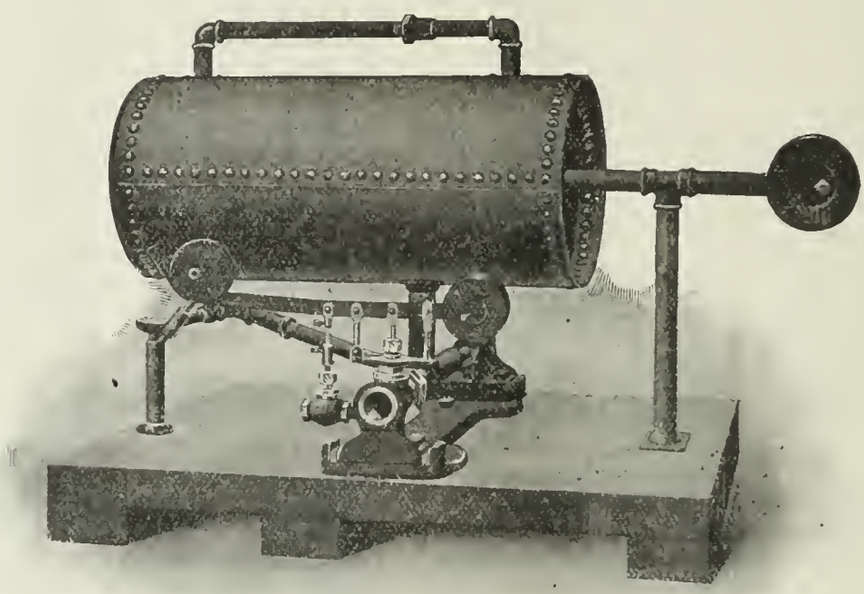
The Sharon Brass Mfg. Company.

A reorganization of the Sharon Mfg. Company of Sharon, Pa., was effected last week. A new company were formed to be known as the Sharon Brass Mfg. Company. The object of the new concern is to enlarge on the operations of the original concern, manufacturing bronze and brass castings, babbitt metal and plumbing goods. The new company are capitalized at $50,000. The plant of the Sharon Mfg. Company, which was taken over, is to be enlarged. The following officers were elected: President, M. O. Shrock; treasurer, John S. Leslie of the Leslie Hardware Company, and secretary, J. L. Merritt of Greenville, S. C. The directors are: S. C. Koonce, Clarksville; R. A. Wilson and T. L. Woodward, Pittsburgh; John S. Leslie, M. O. Shrock and J. L. Merritt.

For some time past two journeymen plumbers' unions have been operating in New York City, but it is now stated that the rivalry has been abandoned. A meeting has been arranged, at which a plan for future operations will be finally adopted.

The Morehead Return Trap.

The condensation from any steam heating or cooking apparatus must be removed. The more quickly the condensation is removed the drier and more effective will be the heating surfaces. It is the greatest extravagance to waste it, as it is pure water and hot. The most effective way to utilize the heat it contains is to deliver it into the boiler before it vaporizes. The Morehead return trap has been designed to handle this condensation quickly and economically. It is constructed of steel, the heads and longitudinal seam being closely riveted and calked, to withstand any pressure carried on the boiler. All working parts are on the outside, in plain sight and easily accessible. The trap is located 6 feet or more above the water line of boiler. The water from the condensing surfaces is forced by the pressure of steam from the boiler through a pipe leading to the trap, with a swing check valve close to latter. As soon as sufficient water has entered the receiver to overcome the weight on the arm the receiver tilts down, allowing the water to pass through the discharge pipe, at the same time opening the steam valve, which has a pipe connected with the dome of the boiler. By equalizing the pressure on the surface of the water in receiver with that in boiler, the water, in simple obedience to the laws of gravity, flows into the boiler. As soon as the receiver is empty it tilts back, as before, and again refills. The trap is prompt in opening and closing, its action being due entirely to gravity. When once set up it requires no further attention. It takes the water from the condensing surfaces, whether they are above or below the water level in the boiler, and automatically returns it to the boiler at the temperature due to the pressure at which the steam is condensed. There is no outlet by which the steam can be wasted. It supplies all the water needed in the boiler from the main pipe, providing there is enough pressure on the main to lift the water to the trap, thus performing the duties of a pump or injector. It operates equally well with high or low pressure coils, or coils using exhaust steam, allowing no condensation to collect in them. This trap is made by the American Blower Company of Detroit, Mich.



The Morehead Return Trap.

H. C. Simmons, North Bennington, Vt., is sending out a very attractive piece of trade literature devoted to the Simmons Heating Boiler. After a brief description of the Boiler and what it is capable of accomplishing, the pamphlet is occupied by a number of half-tone engravings showing fine buildings which have been heated with the Simmons Boiler, including schools, churches and residences. A long list of those who are using the Boilers with satisfactory results in several different States is also given.

A Thawing Apparatus.

The American Heating Company of Boston are reorganizing, and may establish a plant in Worcester for the manufacture of various heating devices in which the principle of a down draft is applied. The company are already placing on the market a street stove for thawing out ground in winter weather, and tests by the Sewer Department of the city of Boston have proved this device to be a success. The same idea will be applied to tar kettles for use in the street to do away with burning of wood in open fire in the street, which causes a good deal of nuisance. The down draft is not a new principle, of course, but the down draft heater invented and patented by Charles Schweizer of Boston has a new idea in its burner or grate. This consists of perforated fire brick, which will not melt at greatest heat, the tendency to melt being the fault of previous burners, because they were of iron. The fire brick becomes incandescent after a time, which it is claimed is caused by the combustion of hydrocarbon and other gases, which in the ordinary updraft fire escape up chimney. The street stove consists of three parts: The stove, which is a sheet iron box with fire brick burners at the bottom; a middle section, which is a long flat box like contrivance, also of sheet iron, and a stack at the further end from the stove. The ground is the bottom of all three. The flame from the wood fuel is sucked down through the grate and acquiring great heat passes along the surface of the ground, in a few hours thawing it to the frost limit. It is claimed for the burner that it can be applied to any stove, boiler or furnace.

Ventilating Ships.

Joseph McCreery & Son, Toledo, Ohio, manufacturers of the McCreery heating and ventilating system, have secured an important contract from the United States Government to install their apparatus in a number of ships. The new battle ship "Maine" is to be equipped with the apparatus which is the invention of the Toledo firm. The McCreery ship ventilating system is coming into general use on the lakes and oceans. The D. & C's. Mackinac fleet is fitted out with the apparatus, as are the recently built ships of the D. & C. and the C. & B. lines. The contract to equip the new "Maine" is necessarily a large one, because of the peculiar construction of a battle ship as compared with vessels belonging to the merchant marine type. A battle ship, because of its vast below water line area and innumerable iron and steel walled compartments, requires an extensive ventilating system, and the work in the "Maine" will involve a considerable expense.

Steam Fitters' Convention.

While it is practically settled that the annual convention of the National Association of Master Steam and Hot Water Fitters will be held at Atlantic City, N. J., the date has not yet been decided upon. There is a strong probability, however, that the convention will be held on June 11, 12 and 13, National Secretary Henry B. Somers being now engaged attending to the final preparations with a view to the date mentioned. The announcement of the time for holding the convention will probably be made at an early date. Should the National Association of Master Plumbers select the preceding week for holding their convention in Atlantic City, doubtless many plumbers and steam fitters will find it desirable to attend the convention.

The Hitchcock Plumbers' Supply Catalogue.

The Hitchcock Supply Company, 72-74 Dwight street, Springfield, Mass., are sending to the trade, in a yellow cloth cover, a catalogue of 834 pages devoted to supplies of every description for plumbers, water works, steam and gas fitters and tinners. The frontispiece is a picture of the four-story brick building which the company occupy, and the title page presents their trade-mark. The introduction calls attention to the extensive line of goods which they carry and their ability to fill orders promptly. Special attention is directed to the convenient arrangement of the catalogue for ordering goods and the use of letters instead of numbers, to aid in avoiding errors. This is followed by a special notice in reference to terms and an excellent index occupying 22 pages.

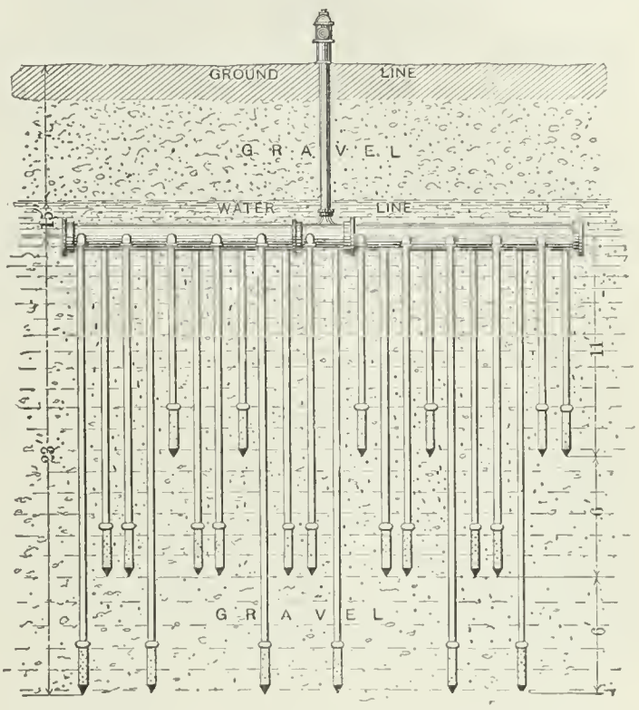
The catalogue proper opens with iron pipe, both wrought and cast, and all of the many fittings in cast and malleable iron used in connecting it, together with various styles of haugers and ring plates, ceiling plates and adjustable floor thimbles. A section is devoted to flanged pipe of cast and sheet metal and the special fittings used in connection therewith. Another portion of the catalogue is occupied by steam and hot water boilers and radiators, with pipe coils, expansion tanks, registers, regulators, steam traps, injectors, pipe covering and packing, and an extensive line of valves. Hose goods and plumbers' brass work occupy another section, including rough and finished brass work for the laundry, kitchen, lavatory and bathroom, of the lever and compression type and of Fuller construction. These water fixtures are followed by waste fittings, including brass overflows and strainers, wash tray wastes, bathtub wastes and overflows in a variety of styles, lead and nickel plated brass traps, lavatory supply pipes and water closet flush and supply pipes, with all the attending brass fittings, including stall fittings of every character. These goods are followed by a great variety of plumbers' sundries, such as washers, gaskets, Fuller balls, closet connection rubber elbows, &c.

Sixty pages are devoted to porcelain and enameled iron French and Roman pattern bathtubs, seat baths, foot baths and steel clad bathtubs, and a variety of styles of shower baths with receptors. Some 60 more pages show an extensive line of marble and enameled iron lavatories, drinking fountains with their supports, and bathroom fixtures in the form of towel rods, soap cups, sponge holders, &c., followed by 80 pages devoted to water closets, urinals and slop sinks, and an extensive line of porcelain and enameled iron kitchen and pantry sinks. Laundry tubs are also shown in solid porcelain and made of slabs. Galvanized iron and copper kitchen boilers, large hot water storage tanks, with tank heaters, occupy another section. A variety of the simpler forms of gas fixtures and brass fittings are followed by burners, globe holders, tapers and tubing.

Speaking tubes, stove pipe and elbows, ventilators, conductor strainers, corrugated conductor pipe and eave trough and hangers are given in another section. Cellar drainers, soil pipe testing plugs, back water traps, hydrants and hydrant fittings are followed by water meters, tapping machines and an extensive variety of lifters and force pumps and hydraulic rams. Fire pots for plumbers and tinners and an extensive variety of tools are also shown, including pipe tongs, pipe cutters, pipe vises and the catalogue closes with lead pipe, block tin pipe and solders, and the various metals used by plumbers and tinners.

Driven Wells for Fire Purposes.

Janesville, Wis., has a driven well for fire purposes which has proven to be a great improvement on cisterns. It consists of two 12-inch water pipes connected so as to extend in a line and a 5-inch wrought iron pipe all connected to a central T, the wrought iron pipe extending



Driven Wells for Fire Purposes.—Fig. 1.—Elevation Showing Feeders, Main and Service Pipes.

to the surface, as shown in the elevation given in Fig. 1, and on both sides of the water main, or reservoir, points put down at irregular depths, from 10 to 20 feet. The points are driven from 4 to 6 feet from the main, as shown in Fig. 2, which is a plan and in line with the nipple to which they have to be coupled.

Before laying the apparatus the earth should be excavated to the level of the water, where the excavation should be not less than 28 feet long by 14 feet wide. This kind of water supply, says *Municipal Engineering*,

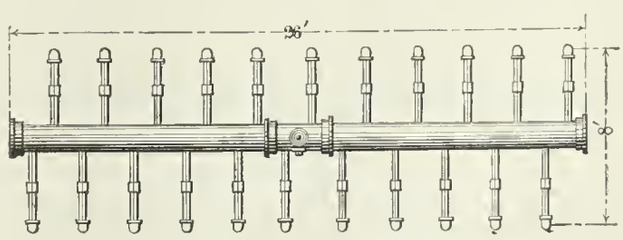


Fig. 2.—Plan Showing Location of Feeders.

cannot be obtained in all localities. The water line must be within reach of the suction of the engine, and the points, no matter how deep they are, must rest in a gravel formation. The placing of the 12-inch water pipe, to which the points are all connected 2 feet below the water line, gives a free flow of water in the pipe under an 18-inch head, faster than any steam fire engine can take it out.

FRED. S. TODD, who for the past 32 years has conducted a Plumbing, Hardware and House Furnishing Goods business in Adams, Mass., announces that he will retire from business and hopes to close out his entire stock by May 1. Mr. Todd is now so situated that he will require considerable time to look after his property and real estate, and his hard work in the past entitles him to the rest and comfort which he can now afford.

A Useful Siphon.

The principle of the siphon—not the article which contains soda water and is frequently associated with the whisky bottle, but the mechanical appliance properly known as the siphon, says the *Ironmonger*—might be employed with advantage much more frequently than is the case. We purpose describing, 1, the principle of the common siphon, and, 2, a particular and useful form which can be easily made by any tinsmith or sheet metal worker. In Fig. 1 we show a siphon, simply an inverted U-shaped tube with one leg longer than the other. Assuming that it is desired to empty a cistern or other vessel which has no outlet at or near the bottom, the short end A is placed therein, and if the water or other liquid can be made to fill the tube a flow from the end C is at once started, which will only cease when the siphon is removed, or when the vessel has been emptied. The action is caused by the force of gravitation. The volume of liquid in the longer end B to C is heavier than the liquid in the short end A and B. When the tube has been filled and the ends are opened, each column of water tends to fall. If both were to do so a vacuum would be created in the bend, a phenomenon which does not occur in nature. The heavier column of liquid has its way, and issues through the end C. This sets up a suction, which acts upon the column A B with a force greater than the force of gravitation, and in the reverse direction. Thus the fluid is drawn up the tube at A and discharged through C until the supply is exhausted.

There are several ways of starting the flow. The easiest is by sucking, and the mouth of the ordinary ironmonger's apprentice is usually capable of all the necessary sucking power. But petroleum, even if it be Alexandra or Strange's A1, has its objectionable features when received between the lips, and a mechanical means of starting the flow is to be preferred.

The simple apparatus shown in Fig. 2 is possessed of the necessary feature. Let the tube be of pure tin, tin plate or brass, the first named for preference, of ¾ inch or 1

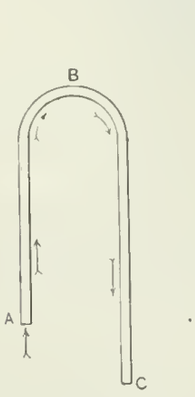


Fig. 1.—A Simple Siphon.

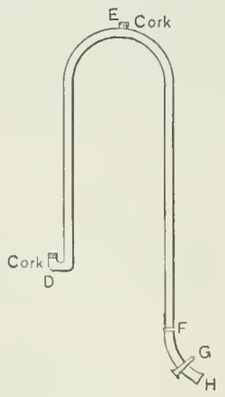


Fig. 2.—A Practical Siphon.

A Useful Siphon.

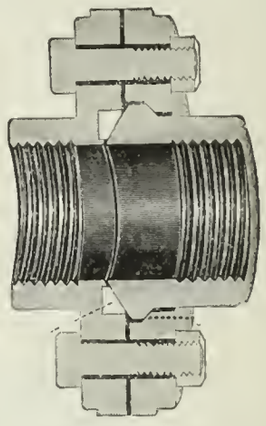
inch diameter. Return the short end in the manner shown at D, and fit with a plug or cork. At the center of the bend E put another orifice, which also fit with a cork. Provide the discharge end F with a rubber tube of a length to suit the purpose of the syphon, and supply an arrangement whereby this rubber tube may be opened or closed at will. A screw cramp or a straight brass tap will do very well. We have seen a split wooden pin similar to a clothes peg used, and it answered well. Our sketch is intended to illustrate this.

To use the siphon close the rubber tube at G, by the device adopted for that purpose, and insert the cork D. Remove the cork E and, with the help of a filler if necessary, fill the tube quite full of the liquid in the vessel it is desired to empty. Then insert the cork E and remove that at D. The liquid will not issue from D when the latter is opened. The return of the tube prevents this. A similar cause giving the same result may be observed in a common chicken fountain, an Excise ink bottle, or a mercurial barometer. Now the end D must be immersed in the vessel to be emptied, taking care to have the orifice completely covered by fluid. When the rubber tube is now released from the compression which closed it the flow will start, and so long as proper conditions are maintained will continue.

This simple accessory may be employed for many purposes. It will be found particularly useful if an oil cask or tank has become dirty in the bottom. The draw off tap in such a cask or tank is, of course, at the bottom, so that dirty oil will always flow first, although the surface oil may be quite clear. A siphon will remove the oil from the top, after which the dirty oil may be run off into a separate vessel and filtered.

The Jefferson Pipe Union.

The principal feature of the pipe union and flange designed by the Jefferson Mfg. Company of Boston is a ball joint with a bronze seat firmly incased in malleable iron, both upon the inner and outer side. This



The Jefferson Pipe Union.

makes it impossible to force the seat out of place and permits any number of connections, while still maintaining a tight joint. The use of the ball shoulder joint insures the true seating of the parts without reference to the alignment of the pipe. The union is made for high and low pressures and with either brass, copper, lead or iron seats.

Glass Bathtubs.

Bathtubs of glass are being made in Germany and are said to have many advantages over metal and enamel, the principal one being that they are much cheaper. They are also strong. Those being made now are 5 feet 6 inches long, about 2 feet wide and about 2½ inches thick. They are made in a solid piece, and one can be turned out complete in about five minutes. The method of manufacturing glass bathtubs, as described by a contemporary, is very simple. The molten glass is taken from the furnace and placed in a mold, which can readily be swung into any desired position. Compressed air is then admitted through a flexible tube which connects with the bottom of the mold. The air pressure is regulated by valves. As soon as the article is finished it is switched into an annealing chamber, where it is again heated and then allowed to cool. This toughens it, and after the process it is ready for use.

The Work of Health Boards.

Wm. Paul Gerhard, the sanitary engineer, is authority for the statement that "Experience has shown that the control and inspection of plumbing and drainage work by Health Board officials greatly reduce the chances for scamped work and tend to avoid bad layouts, the use of poor material and criminal workmanship. The honest and conscientious workman, as well as the public, are hereby benefited. If the practical work done by efficient health boards were better understood by the public at large it would also be more appreciated.

"Universal appreciation or approval can, as yet, hardly be expected; for, in every community, whether in cities or in the country, persons exist who remain inimical to the efforts made by health officials to improve

the sanitary condition of habitations. But I venture to assert that a greater degree of appreciation of their labors will, in the course of time, be shown by the public wherever health officers and plumbing inspectors perform their work in an honest, fearless and efficient manner."

American Radiator Company.

The annual meeting of the American Radiator Company was held on March 5, when Joseph Bond, Clarence M. Woolley and Charles H. Hodges, the directors whose terms expired, were re-elected, and James B. Dill was elected a director in the place of William H. Hill, resigned. The annual report was presented, disclosing a satisfactory condition of the affairs of the company. It shows net profits from operation for the fiscal year ended January 31, 1902, of $417,614, which compares with $317,997 the previous year.

The common stock shows earnings of over 8 per cent. Following are the figures:

	1902.	1901.	Increase.
Net profits	$627,014	$527,997	$99,617
Dividends	210,000	210,000	.....
Totals	$417,614	$317,997	$99,617

The balance sheet of the company as of January 31, 1902, is as follows:

Assets.

	1902.	1901.
Real estate, plant, &c	$6,625,730	$6,725,730
Depreciation	100,000	100,000
Net	$6,874,174	$6,625,730
Cash	211,439	166,839
Notes redeemable	25,073	60,146
Stocks and securities	.....	6,300
Accounts receivable	1,285,059	1,006,146
Raw material, supplies, &c	944,318	1,036,802
Totals	$9,340,063	$8,901,965

Liabilities.

Common stock	$4,893,000	$4,893,000
Preferred stock	3,000,000	3,000,000
Accounts payable	211,789	191,305
Balance	1,235,274	817,660
Totals	$9,340,063	$8,901,965

President Bond, in his annual report to the stockholders, says:

Prosperity has prevailed in our line of industry in all sections of the country during the past year. There has been unusual activity in the construction of buildings, and we have enjoyed a constantly improving demand throughout the year. Gratifying progress has been realized, not only in the volume of business, but also from important refinements of organization and in all departments. Genuine advancement has been made in cooperative economy in the utilization of our several plants, and abundant provision is being made for the larger demand by the erection of a new plant at Buffalo, N. Y. Each year emphasizes the conveniences and benefits from the varied locations of our plants and branches, and of the great advantages to our patrons from the distribution of the larger volume from the several natural distributing centers, instead of from any one or two or three points. During the past year greater publicity has been given to our products through our advertising department, with excellent results from remote sections, and in fact from all sections.

The foreign business has for some years continued to grow until its proper care and development necessitated the construction of a plant in France, which is in successful operation, and although steam and water heating appliances are thus far used to but a limited extent in that country a good beginning has been made. In Germany it has also been found desirable to construct a plant, which is nearing completion and which will be in operation within a few months, the introduction of American methods of manufacture proving to be the best policy and promising better for the future than any other course.

JOHN KELLY, father of John T. Kelly and W. J. Kelly of the Kelly & Jones Company of Pittsburgh, died suddenly on February 21 at his home in New York City, aged 92 years. Mr. Kelly was for about half a century a resident of Allegheny, Pa., and moved to New York about 12 years ago. He was born in Ireland and came to America when a young man.

ASSOCIATION NEWS.

Michigan Master Plumbers.

The tenth annual convention of the Michigan State Association of Master Plumbers was held at Ann Arbor, on February 26, upward of 75 delegates being present. After transacting the routine business, the following officers were elected for the ensuing year:

President, F. H. Morgan, Detroit.
Vice-President, James H. Quinlan, Ann Arbor.
Secretary, W. I. Holt, Detroit.
Treasurer, J. H. Wheeler, Kalamazoo.

The delegates were entertained at an elaborate banquet, given by the local association.

Ridgewood, N. J., Master Plumbers.

A letter from William P. Morgan, Ridgewood, N. J., informs us that a master plumbers' association was organized at Ridgewood, N. J., on March 1, and the following officers elected:

President, William C. Banta.
Secretary and Treasurer, William P. Morgan.

New York City Notes.

A number of plans for business buildings and hotel apartments are being filed with the Building Department and a few for private houses, as well as some for alterations, but hardly any for buildings coming under the scope of the Tenement House Board. Amendments to the tenement house law are now before the State Legislature, and are said to stand a good chance of passing. Pending the passage of these amendments there is no business doing in the building of tenement or apartment houses.

* * *

Apparently the journeymen plumbers anticipate a good season this year, as there are rumors that they will demand a substantial increase in wages. Judging from the number of men who are now out of a job, and the outlook for increased business, this demand for a possible large increase seems out of place.

* * *

The attack on the "conditional bill of sale" law in the State Legislature will probably be successful. The bill is out of committee and has been ordered to a second reading. The conditional bill of sale, in the absence of an equitable "mechanics' lien" law, gave a large amount of protection to both plumber and dealer in cases where the job looked shaky, and doubtless all the loan interests which fatten on the foreclosure of property and the wiping out of mechanics' liens and interests in buildings are behind the bill to do away with this newly discovered method of protection to the plumber.

* * *

Samuel Schleman, an unlicensed plumber of 63 Mott street, was held in bail for trial by Magistrate Deuell in the Tombs Police Court on Wednesday last for doing work at 16 Pell street. The complaint came from the Law Committee of Manhattan Branch.

Broomell's Patent Vapor System.

The Vapor Heating Company, York, Pa., are sending to the trade a 58-page catalogue devoted to the Broomell patent vapor system for heating buildings with steam. In presenting the second edition of this publication the company call attention to the many fine buildings in which the system has been installed, and point out that it has all the advantages of hot water heating without any weight or pressure in the radiators; that it is noiseless; has no air valves; that each radiator can be wholly or partly heated; that the system is adapted for use with any good boiler and that by the use of smaller piping than is generally used for heating the first cost is re-

duced. The catalogue is illustrated with fine half-tone engravings of many substantial and handsome business buildings and residences in which the system has been installed. General and broken views show the company's special valve and illustrate the ease with which the entire system can be operated. The catalogue treats in a pleasing manner of steam heating, leading up to the Broomell patent vapor system, which is explained in detail so that its features and operation can be readily understood. The last pages contain views showing different methods of piping and give full directions for installing a complete working system. The company agree to render such assistance to steam fitters as will enable them to install the system so that it will work to the best advantage.

Business Men's Championship Bowling Tournament.

The members of the Plumbing and Steam Supply League have decided to enter the Business Men's Championship Tournament, which opens at the Monarch Bowling Alleys, Twenty-sixth street and Sixth avenue, New York, on March 10. The other contestants come from the following leagues: Commercial, Drug Trade, Custom House, Bank Clerks' and Fire Insurance. The Plumbing and Steam Supply League have elected Wm. S. Emery as captain and have selected the following team and substitutes: Regular team: C. W. Grimshaw, A. E. Good, J. S. Dibley, Rollin C. Wilson, W. T. Gilmour, C. A. Blanchard, E. E. Haff, W. S. Gibbs, W. S. Emery and A. Behrer, Jr. Substitutes: Henry Maurer, Jr., E. E. Benas, John F. Hirsch, E. F. Ryder, A. B. Beith, George E. Myers, W. C. Hallett, R. J. Pearson and M. McCormack. The other members of the Plumbing and Steam Supply League may become eligible for a place on the team by good record in practice, and they are invited to meet Captain Emery on the alleys on two evenings every week and every Saturday afternoon.

The Plumbing and Steam Supply League team will meet opposing teams on March 14, 21 and 31; April 11, 18, 22 and 29, and May 9, 12 and 20, when Captain Emery invites a full attendance of members to encourage the team. The social meetings of the trade, which were brought about by the tournament just closed, are looked upon as of great benefit. The new tournament is entered into with spirit and has awakened a wide interest. In the relaxation from the restrictions and cares of business that is enjoyed at the bowling contests many friendships have been established, and many incidents that, under old conditions, would have been annoying have been made amusing by mutual explanations.

Prize Contest.

The Standard Sanitary Mfg. Company of Pittsburgh, Pa., have decided on what should prove a popular method of advancing the sale of enameled bathtubs, sitz baths, lavatories and other sanitary fixtures. They have arranged to distribute $1000 in prizes to plumbers who make the best display of these goods. Those who desire to enter the contest for one of these cash prizes can secure full particulars as to the conditions that must be complied with by addressing the company and securing the little pamphlet which gives the desired information.

Mr. Whipple Gives Sleigh Ride to Children.

William L. Whipple, a well-known plumber and stove dealer in the western section of Providence, R. I., who has made it a custom for many years to give the children of the Tobey Street Home in that city an outing during the sleighing season, has again followed out his laudable custom. The following item from the Providence *Journal* of February 26 gives an account of the outing, which took place last week:

"Through the kindness of William L. Whipple of Providence the children of the Tobey Street Home, 84 in number, enjoyed their annual sleigh ride. Two large sleighs conveyed the merry party through the streets of the city, starting at 1.30 o'clock in the afternoon. It was an outing such as is very seldom enjoyed by the children of the Home, and their exuberant spirits were manifested by singing, blowing of horns and waving of flags. The ride continued until evening and was a thoroughly enjoyable one, the action of Mr. Whipple being decidedly appreciated."

Heating and Plumbing Notes.

An assault on a nonunion plumber by a member of a local union of Memphis, Tenn., brought on an action in court, owing to an injunction which has not been discharged. After hearing the testimony the court decided that the assault in no way affected the injunction and took the opportunity to impress upon the striking members of the union the constant danger of the violation of the injunction. Notice was served that the court would fully protect the rights of the master plumbers as defined by the injunction in the case.

F. J. Lennox has engaged with the Thatcher Furnace Company, 240 Water street, New York, in their steam and hot water department, and will visit the trade in the metropolitan district.

William T. Disley, Waterbury, Conn., has the contract for the plumbing, metal work and roofing for the new building of the Milford Land & Cottage Company.

The Mason Heater Company, Bellaire, Ohio, have contracted with the Dorer Foundry to manufacture their Heaters until their own plant has been completed.

The American Tube & Stamping Company are reported to have secured an option on property in Bridgeport, Conn., where they contemplate the erection of a large Tube works. The project is contingent on securing a franchise from the city of Bridgeport for operating a street railway line between the site of the proposed plant and the yards of the New York, New Haven & Hartford Railroad Company. The works which the company propose to erect will, it is said, employ 2000 men. The capital stock of the company is $2,300,000, with authority to increase to $5,000,000.

George N. Numsen, City Registrar of Baltimore, Md., will receive bids until March 12 for a complete heating plant for the school building at Chestnut and Fourth avenues, in that city.

A fire recently visited the Steam Fitting Supply house of Joseph McWilliams & Co., 323 West street, Louisville, Ky., doing damage to the extent of $5000, which was covered by insurance.

John H. Newbury, plumber, of Bay Shore, L. I., is having a naphtha launch built which he will name "Ida," in honor of his wife, who takes an active part in his business, giving her special attention to the bookkeeping and financial department.

The master and journeymen plumbers of Cleveland, Ohio, are co-operating in an effort to have the City Water Works Department discontinue having certain plumbing work done by its employees. The plumbers hold that they are compelled to take out licenses to do just such work and should be protected by the city.

The Board of Water Works Trustees of Springfield, Ohio, have cited the local master plumbers to appear before them on account of their failing to report work done by them. Through this neglect, it is claimed, the city suffers a loss, people being supplied with water without paying for it.

Caldwell & Co., Sharon, Pa., have secured the contract for plumbing the new house of the Buhl Club in that town. The heating contract has been awarded to McGinniss, Smith & Co. of Pittsburgh.

Green & Co., 723 Massachusetts avenue, Cambridge, Mass., are installing a large Mercer Sectional Boiler in the Green Acre, a large apartment house in that town. They also have a contract for the plumbing, using copper boilers, enameled bathtubs and nickel plated fixtures.

J. N. V. Lane, plumber and gas fitter, has moved into a new store in the Morse-Oliver Building, Bangor, Maine.

Uriah Wardell of the firm of Cox & Wardell, plumbers, died from heart failure, at his residence in

Taunton, Mass., on February 27, aged 63 years. He was a veteran of the late war, and is survived by his wife, a son and a daughter.

J. L. Bowdish, 44 Lower Main street, Oneida, N. Y., advises us that he would be glad to receive catalogues and price-lists from manufacturers and dealers in Plumbers' Supplies.

The plumbing firm of Hoffman, Brown & Wilson, Circleville, Ohio, have secured the contract for heating and plumbing the new residence of S. W. Beal in that place. They are also doing the plumbing in the residences of Clark Timmons, Charles Wright and James Chaffin.

F. J. Johnson of Waveland, Ind., manufacturer of Acetylene Gas Burners, will move his establishment to Anderson, Ind.

Harris Brothers, Oneida, N. Y., have moved their plumbing shop from the Fleishman Block to more commodious quarters on Lennox avenue.

While visiting a friend William Fenton, a steam heating contractor, of 490 Hastings street, Chicago, fell dead from heart disease, at the age of 40 years.

Erie, Pa., is to have a public bathhouse, to be provided with 165 single booths, with a number of larger ones for the use of parties.

The C. F. Sullivan Company, Holyoke, Mass., have two important contracts for overhauling and completely renovating the plumbing in the residences of L. Sears and F. B. Heywood in that city.

S. B. Church, Seymour, Conn., makes a business of constructing towers for supporting water supply tanks and furnishing tanks of all sizes. He is now making a specialty of the construction of sprinkler systems for fire protection in factory buildings. Mr. Church has secured contracts for erecting a 75-foot steel trestle, with a 50,000-gallon tank, for the Cable Flax Mills at Schaghticoke, N. Y., and similar equipment for the Eaton-Hurlburt Company, Pittsfield, and a number of others.

The contract to furnish ten hot and ten cold mills for the new plant of the McKeesport Mfg. Company at McKeesport, Pa., has been awarded to the Wheeling Mold & Foundry Company, Wheeling, W. Va.

The Pittsburgh Seamless Tube Company have resumed operations at their plant at Beaver Falls, Pa., after a year's idleness.

The Lumsden & Van Stone Company, Boston, Mass., manufacturers of Pipes and Fittings, will build a machine shop and foundry at First and L streets, South Boston.

The American Sewer Pipe Company have purchased the old Black mill at East Akron, Ohio, and are fitting it up as a machine shop, utilizing the machinery from the shop at Barberton, Ohio. They will manufacture their own Sewer Pipe machinery.

The Marcy Mfg. Company, Bluffton, Ind., manufacturers of Red Cross Windmills, Tanks, Pumps and Water Works Appliances, have bought a plot of ground, 79 x 140 feet, adjoining their plant, upon which they will build a large brick addition that will double the capacity of their molding room. The machine shop will also be extended. The company have recently completed a building to be used as a galvanizing department. The purchase of this tract of land gives them a large area which they expect to eventually cover with buildings.

The foundry of the Glauber Brass Mfg. Company, at Cleveland, Ohio, was destroyed by fire March 2. The loss is about $50,000.

The City Plumbing Inspector of Nashville, Tenn., is to receive a salary of $1200 a year, and the fee system, heretofore in connection with the office, will be abolished.

The Shaw University of Raleigh, N. C., has received a donation of $15,000 for the construction of a central steam heating plant for heating all of the different buildings.

The Janesville Electric Company of Janesville, Wis., have received a letter from a firm in Dresden, Germany, inquiring about the success of the central station hot water heating plant operated in Janesville.

Alfred Wolstenholme is visiting the trade in New Jersey in the interests of the United States Radiator Company of Dunkirk, N. Y.

King & Snyder are a new firm in the plumbing business at 61 West Milwaukee street, Janesville, Wis. The firm are composed of Charles E. Snyder, who has been for eight years in the employ of McVicars Brothers and George King of the old firm of King & Reichert. A great deal of work has been done in Jefferson and also at Fort Atkinson under Mr. King's superintendence. The firm will also do steam and gas fitting.

Atlas Pipe Wrench Company, 51 Flood Building, San Francisco, Cal., and 121 Liberty street, New York, are the manufacturers of the Atlas Pipe Wrench and Atlas Tube Cleaner. Concerning the Tube Cleaner, they have on exhibition at their New York office samples of the scale removed from boiler tubes through the agency of the Cleaner, as proof of its effectiveness. One of the large sugar refineries which has been testing the device has recently ordered a number of additional Tube Cleaners. The Pipe Wrench is of peculiar construction, having three distinct points of adjustment for varying diameters of pipe.

The Trade Golf Association have been organized at Chicago, with John D. Hibbard, president; J. B. Rahm, vice-president; Chauncey L. Williams, secretary; Paul Blatchford, treasurer, and S. O. Dugger, captain. The first tournament will be held June 24 in connection with the meeting of the Central Supply Association, at Hotel Victory, Put In Bay, Lake Erie.

Several representatives of the plumbing supply trade in New York recently visited Albany to present their objections to the Wilson Assembly bill, which, if passed, would practically do away with the conditional bill of sale now in existence.

John Droz, a member of the Stradling Plumbing & Heating Company, Utica, N. Y., is to be appointed a member of the City Plumbing Board, to succeed himself.

New Firms and Changes.

The Hyde Park Mfg. Company have been incorporated at Portland, Maine, with a capital of $2,000,000, of which $300 is paid in, for the purpose of manufacturing Ventilating Apparatus. The officers are: C. A. Hight, president, and Leroy L. Hight, treasurer.

Becker & Klett are a new firm, at Camden, Maine, in the plumbing, stove, tinware and hardware business.

The Howell Plumbing & Construction Company, 106 Market street, Camden, N. J., have been incorporated with a capital of $5000, by Charles S. Warner, John E. Beatty and Lewis O. Howell, to conduct a plumbing and heating business.

The American Gas Generating Burner Company of New York City have been incorporated with a capital of $500,000. The following are the directors: James R. Mullikin, G. A. Connor, E. F. Morgan, William Sutphen and G. N. Goddard.

The Plimpton & Hills Corporation have been organized at Hartford, Conn., with a capital of $25,000, to conduct a plumbing, gas and steam fitting business. W. T. Plimpton, Raymond Hills and Alfred A. Olds are the incorporators.

The Avery Acetylite Company have been formed at Chicago with a capital of $15,000 by P. C. Avery, G. L. Wilkinson and H. S. Gaither, for the purpose of manufacturing Heating and Lighting Apparatus.

B. A. Adams, who has been in the employ of Dunn Brothers & Co. for a number of years has opened a plumbing shop for himself at 61 West street, Rutland, Vt.

Warnick & Martin are a new firm, at Parkersburg, W. Va., who have bought the plumbing business of W. G. Franklin.

George J. Smith, 140 Dwight street, Springfield, Mass., has sold a half interest in his plumbing and gas fitting business to J. J. Cotter. The firm name in future will be Smith & Cotter.

Robert Curdie, Sr., Robert Curdie, Jr., and Norman Challacombe, have formed a new company to conduct a plumbing and steam heating business at Alton, Ill.

B. P. Stanton & Co. are a new firm in the plumbing business at Memphis, Tenn., composed of B. P. Stanton of the firm of J. S. Stanton & Co. and A. H. Yates. They are located at 318 Front street.

F. D. Harris, for the last 10 or 12 years engaged in the plumbing, hot water and hot air heating and tin roofing business in Onelda, N. Y., has formed a partnership with O. D. Wright, traveling salesman for the Oneida Community, Limited. The firm expect to add to their business that of slate roofing. The new firm will be locatel at 4 Lenox avenue, in a building which will be remodeled to suit their purposes, a new shop being added.

The Prox & Burget Company, consisting of Anton F. Prox and John H. Burget, have opened a store and shop at 829 Wabash avenue, Terre Haute, Ind. They have purchased from the Prox & Brinkham Mfg. Company their steam and hot water heating, plumbing and gas fitting department.

George Haucke, Springfield, Ohio, has added another department to his store. The new venture is a complete Plumbing Supply house, with all adjuncts and a force of competent plumbers. At the present time he is prepared to do all gas and steam fitting.

The American Dowsing Radiant Heat Company, Jersey City, N. J., have been incorporated to manufacture Electric Motors, &c., with a capital of $300,000. The incorporators are Horace S. Gould, John I. Billings, Evan J. Dudley, T. S. Buckingham and Louis D. Dailey.

The J. W. Jordan Company have been incorporated at Worcester, Mass., with a capital of $7000, to conduct a business in Stoves, Ranges, Furnaces, Combination Hot Air and Hot Water Heating and Sanitary Plumbing. The officers of the new company are: Frederick B. Jordan, president; Harris T. Gray, treasurer; Frederick W. Leavitt, director. The other officers are also directors.

The Car Shortage.

The situation as regards the shortage of cars in the Pennsylvania coke regions seems to get worse instead of better. Advices from Uniontown, Pa., state that there has never been anything like the present congestion in that region, both as to shortage of cars and lack of motive power. The conditions have been growing steadily worse for months, until the activity of the regions is practically paralyzed. The workmen are obliged to be idle for two or three days of every week. Even when empty cars can be had on the sidings, all of the coal yards are so full of loaded cars that there is no place to stand the empties. Most of the local concerns are running little more than half time, and the men are making hardly enough to keep their families. Mountains of stacked coke and long lines of filled cars standing on the sidings are now the rule throughout the region. Conditions are as bad for both operators and men as they were during the panic, except that the enforced idleness is caused by lack of transportation facilities instead of lack of orders.

A movement is on foot in Germany, under the leadership of certain members of the Prussian Parliament and officials of the workmen's unions, having for its object the abolition or restriction of night work in factories. The demand will be made that night work shall be unlawful in the case of women or males under the age of 18 years. For adults it is proposed that eight hours shall be the maximum legal period of night labor. It is intended to make these provisions extend to all branches of industry, including workshops, mills and factories, as well as hotels and various forms of traffic and transportation.

Dr. Arsene d'Arsonval of the Paris Academy of Sciences, says a contemporary, has discovered a method of extracting from ordinary petroleum oil a liquid that will not congeal even at a temperature of 205 degrees below zero. This "petrolcum ether," as it is termed, is declared to be of great value, especially in scientific research, permitting the construction of thermometers of a greater precision than any hitherto made. It is also proposed to utilize this material as a cooling agent for refrigeration of dwellings, offices, ships' cabin, &c.

Death of Leonard Lewisohn.

Leonard Lewisohn of the firm of Lewisohn Brothers, New York City, one of the best known men in the metal trade of this country, died in London, England, on Tuesday, March 4, from pneumonia, after a brief illness. Mr. Lewisohn was born in Hamburg, Germany, 54 years ago, and came to this country when 18 years of age as a representative in New York of his father's business. He subsequently became interested in copper mining, and several years ago formed the firm of Lewisohn Brothers, who became one of the strongest in the metal industry. About two years ago this business was transferred to the United Metals Selling Company, who marketed the product of the Amalgamated Copper Company. Mr. Lewisohn was president of the former company until the end of last year. He then continued the firm of Lewisohn Brothers, taking with him two of his sons. Mr. Lewisohn was a director of the American Smelting & Refining Company, and was also interested in a large number of industrial, mining, railroad and financial corporations. He was a member of the New York Stock, Metal and Coffee exchanges. He leaves four sons, Jesse Lewisohn, the eldest, being the active head of the United Metals Selling Company.

The Working Men's College, Melbourne, Australia.

The 1902 prospectus of the Working Men's College of Melbourne, Australia, which has just reached us, a substantial publication of 128 pages, profusely illustrated and well arranged, gives full particulars of the extensive line of work in technical, trade and commercial education that is being carried on by that valuable institution. The statistics show a total of 2160 pupils enrolled in the various classes in the year 1901. During the past year nearly $10,000 were spent in machinery and equipment for the new workshops erected in 1900 at a cost of about $25,000. The trade school department of the college embraces classes in carpentry, sheet metal working, plumbing and gas fitting, printing, carriage building, turning and fitting, blacksmithing, metal founding, house and sign painting, graining and marbling. Civil, mechanical and electrical engineering, architecture, chemistry, mining and metallurgy and agriculture are other subjects in which instruction is provided. The courses extend over periods of two or three years, and the year is divided into four terms.

The preliminary census report of the manufacturing industries of New Jersey shows a total capital invested in such industries of $503,824,082, an increase of nearly 101 per cent. from 1890 to 1900. The value of manufactured products in 1900 is placed at $611,728,933, an increase of almost 73 per cent. There were in 1900 15,481 manufacturing establishments in the State, an increase of 68 per cent., and 241,581 wage earners, an increase of 101 per cent. The total wages paid in 1900 amounted to $110,088,605, an increase of almost 33 per cent., while miscellaneous expenses increased 131 per cent. to $42,640,143, and the cost of materials used was $360,941,870, an increase of 91 per cent.

Commenting on the announcement that the London General Omnibus Company have given out a contract for the lighting of their vehicles by means of acetylene lamps, a cockney poet, quoted by the *Ironmonger*, perpetrated the following quatrain:

"With omnibus companies—big ones, I mean—
The acetylene lamp something novel, of course, is.
But the 'pirate' 'bus owner, they tell me, has been
For ages employing a set o' lean horses."

THE LETTER BOX.

Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

HEATING WATER WITH STEAM.

From C. A. G., Haverhill, Mass.—Will *The Metal Worker*, or some of its readers, give me information as to the amount of steam pressure needed to heat a 40-gallon boiler, by inserting a steam coil made of ¼-inch pipe and consisting of four pipes? Will the condensation be great after the water has been heated to 125 or 150 degrees. When the water has reached a temperature of 200 to 210 degrees, will there be much, if any, condensation? Would the tax on the boiler be equal to a 75 or 100 foot radiator placed in a room?

Answer.—A pressure of 5 pounds will heat the water, and, naturally, after the water has been raised in temperature, the condensation will be reduced and will be less as the water approaches the temperature of the steam. The tax on the steam boiler will depend on the amount of hot water drawn off and cold water entering the hot water tank, but under ordinary use it will be about as mentioned.

RECEIPT FOR COPYING PREPARATION.

From Interested Reader, Cincinnatus, N. Y.—Can you give me, in the Letter Box, receipt and directions for making the preparation used in a hectograph, or a receipt for a coating which is put on the paper in a duplicating process, similar to the hectograph, only the negative is made directly on the coated paper instead of on the gelatin pad in the pan? I should also like to know how to make black copying ink.

Answer.—The coating on paper for hectograph transfer should be made of the same material as the hectograph pad, but to be applied by dipping the paper or passing it through the gelatin solution while it is hot and laying the charged paper on a flat board or glass to cool and to give it time to set. For the composition use the proportions of 1 ounce of the best white glue—Cooper's gelatin preferred—add 6 to 7 ounces of white glycerin, more in winter than in summer. Soak the glue or gelatin in water overnight to thoroughly swell it, pour off the excess of water, add the glycerin and heat to near the boiling point, and carefully stir until the water is evaporated. Add 20 drops of oil of cloves to prevent molding, if to be kept for a time. When the solution is clear of bubbles and hot, dip the sheet of paper into and through the solution, or, by care, one side of the paper may be passed over and in contact with the solution and laid flat, so that the solution will harden evenly on the surface; or the solution may be painted on the paper hot with a brush. When paper is to be used for copying it should be quickly wet with a damp sponge and allowed to nearly dry. The ink is prepared by dissolving 1 ounce of aniline violet or blue in 7 fluid ounces of hot water, and, on cooling, adding 1 ounce of alcohol with ¼ ounce of glycerin, a few drops of ether and 1 drop of carbolic acid. For a black use "Nigrosine" (aniline black), as above.

TEMPERATURE OF STEAM.

From H. F., Washington Depot, Conn.—Does the temperature of steam in a boiler increase with the pressure, and if so please give me the rule for ascertaining the temperature at any given pressure. Is the temperature of the water at the bottom the same as the steam at the top?

Answer.—The temperature of steam increases with the pressure. A table of the temperature at different pressures is given in many of the trade catalogues, and will be found in any steam engineering handbook. The steam in a boiler is always at a slightly higher temperature than the water in it.

THAWING CONDUCTOR PIPES.

From W. H. Regner, Marshalltown, Iowa.—A successful and cheap method of thawing conductor pipes which I have thoroughly tested may be of some interest to some of the readers of *The Metal Worker*. Fig. 1 shows a building with the eave trough and conductor pipe with a 1¼-inch wrought iron pipe placed inside of the conductor for this purpose. This iron pipe is arranged so that no water can get on the inside of it. This is accomplished by letting the top end of the iron pipe extend above the eave trough and then covering it by means of a hood. It is raised to sufficient hight to prevent the water from the roof overflowing it. I have used this method successfully by making a small 8 x 8 inch sheet iron fire pot with a 1¼-inch flue to fit on the bottom end of a 1¼-inch pipe and connected with it as shown in Fig. 2. The heat generated in the fire pot circulates through the 1¼-inch pipe, and there is no diffi-

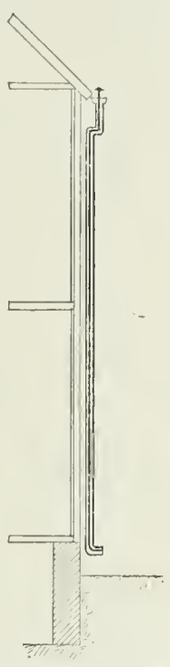


Fig. 1.—System Arranged for Use.

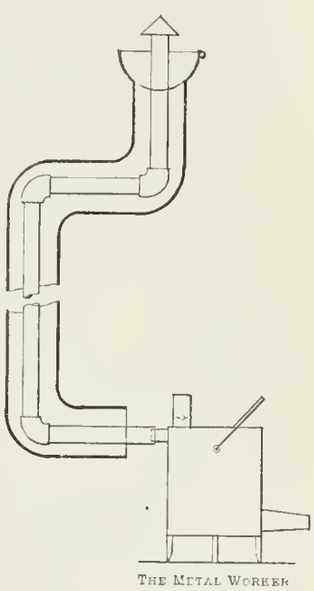


Fig. 2.—Enlarged View showing Heater.

THAWING CONDUCTOR PIPES.

culty in thawing out the ice, however thick it may have become. If it is to be used generally I would advise the use of a larger conductor pipe, otherwise the water carrying capacity is considerably reduced.

WHERE SHOULD VACUUM VALVE BE PLACED?

From M. P., Paterson, N. J.—I have read the letter of "F. E. J.," in *The Metal Worker* of March 1, and would present my views on the subject as follows: A vacuum valve is placed on a boiler for the purpose of preventing the water being siphoned out of it from any cause. If it is connected to the supply pipe by means of a tee, as shown in the sketch given with "F. E. J.'s" article, it will break the siphonage, whether there be a hole in the tube in the boiler or not. If it was located at the stop cock on the supply pipe it would break the siphonage in the same way, but I would prefer having it connected at the top of the boiler.

In reference to the second question, I am decidedly of the opinion that siphonage cannot be stopped by means of opening the hot water faucet at the sink. If there is no hole in the delivery tube and it fits tighly into the supply connection, or is soldered fast to the spud, as is sometimes the case, air could not enter the crown of the siphon under such conditions; consequently the siphonage would continue until air could enter the bottom of the short leg of the siphon or the delivery tube in the boiler.

From D. F. N., New York.—In answer to the question of "F. E. J.," in *The Metal Worker* of March 1, I

would say that he is quite right in placing the vacuum valve, as shown in his sketch, at the top of the boiler, so as to break siphonic action immediately. I would further say that very little relief would come from opening the hot water cock at the kitchen sink, as can be proved by placing a bent tube or a piece of rubber hose in an open pail of water. The whole pail being open would afford quicker relief than if it was a tight covered pail with an open pipe leading into it, as in the case of opening the hot water faucet at the sink. In case of a vacuum being created in the boiler, then opening the hot water cock would relieve the boiler very quickly, admitting air to fill the vacuum and prevent the boiler from collapsing. The latest method of avoiding siphonic action is the provision of a hole in the boiler supply tube, for the reason that the vacuum valve is likely to get stuck now and then.

POOR DRAFT IN STONE CHIMNEY.

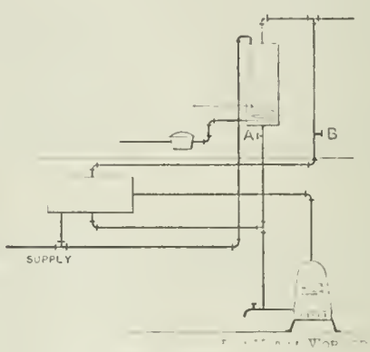
From James Wood, Noroton, Conn.—In *The Metal Worker* of January 18 "F. H. W." wants to know how to cure a poor draft in a stone chimney. He does not state whether there are any hills or houses in the vicinity to affect the draft, neither does he state whether the boiler works when there is no wind or what winds trouble him the most. During the many years that I have read *The Metal Worker* I have noticed that numbers of people want to know how to cure poor draft and that they have received much advice. It is a difficult matter to make a chimney work if there is an open fire place in the parlor or other room connected with it. When the fire is made of green wood there is no smoke in the room, but just as soon as a door or window is opened the smoke will rush out into the room. This may also be caused when a woman walks past the fire place, as the movement of air caused by her walking will draw the smoke into the room for a few seconds. This back draft has caused many a mason and tinner to lose a night's rest in endeavoring to discover a remedy. In olden times flues were made large and the people had very little trouble with the draft. Now most of the trouble is due to the fact that the flues are made too small. A contractor will build a chimney, and it will possibly work for a year, when it will give him trouble. Then experiments begin without success, and he may rebuild the chimney on the same lines, after which he seeks information wherever he can get it, and is advised to put a chimney top of some character upon it. The top will work all right until worn out.

I would suggest to "F. H. W." that he be careful to select the right kind of chimney top. I have cured many chimneys where others have failed, and feel confident that I can succeed in making his chimney operate. Last year I contracted to cure seven chimneys in New York City. I succeeded in curing six in short order, but the seventh gave me trouble. The building was of brown stone, six stories in hight, and located not far from Fifth avenue. When the owners found me having trouble with the seventh chimney they chuckled to themselves and thought that I faced failure. But I stuck to my task and finally cured the trouble. The flue of this chimney was 14 x 11 inches and attached to it was a steam heater having an 18-inch smoke pipe, a heater for hot water for domestic purposes with a 6-inch smoke pipe and also a Rider engine which has a 6-inch smoke pipe. Nevertheless this chimney now operates satisfactorily.

A condition to which I would call the attention of your readers is the accumulation of gas when fresh coal is heaped on the fire by the janitor. When there comes a sudden change in the weather, even if the smoke pipe was 18 inches in diameter, if the flue was 14 x 11 inches the gas from the coal will be generated so quickly that it will accumulate in the chimney and the wind blowing on the outside will hinder its escape. Then if the inmates of the house are startled by the smell of gas and there is an explosion of more or less violence in the cellar there is no occasion for surprise. A similar condition is brought about frequently by placing a large flag or other obstruction on the top of the chimney to keep the rain water out, instead of using a suitable chimney top. I have no desire to pose as the only successful chimney doctor, but would like to have a chance to try the chimney of "F. H. W." if he has not already found a remedy. If he has I hope that he will describe it for the benefit of the readers of *The Metal Worker*.

A PROBLEM IN BOILER CONNECTIONS.

From I. S. H., Scranton, Pa.—Having read the letter of "B. H. C." in *The Metal Worker* of March 1, I present a sketch herewith, which is my suggestion of how the piping should be run. According to the drawing of "B. H. C.," the upper boiler is supplied with water through the lower boiler, consequently a branch supply pipe will be needed to connect with the upper boiler. The hot water service pipe from the lower boiler should be connected with the hot water service pipe from the upper boiler, and a valve should be placed on it at B. The pipe from the bottom of the upper boiler should have a valve on it at A, and should be carried down and connected with the pipe from the bottom of the lower boiler. Then when the upper boiler only is in use both the valves, A and B, may be closed. This will furnish hotter water



A Problem in Boiler Connections.

than if these valves were open. If they were open the water would rise out of the top of the upper boiler, and when it did not run off through the main service pipe it would fall through the pipe having the valve B on it and flow into the lower boiler. The cold water in the lower boiler would find its way up through the pipe having the valve A on it to the upper boiler to keep up the circulation.

I am afraid, however, that this circulation would be sluggish and that very little hot water would reach the lower boiler. On the other hand, if the steam was shut off from the water heater in the upper boiler and the fire was run in the little heater connected with the lower boiler, the circulation would be up through the pipe having the valve B on it, and could either flow to the fixtures or into the upper boiler and return through the pipe having the valve A on it and run into the lower boiler to be reheated. This would not make any very considerable change in the present piping, and in all probability would be as satisfactory as some more elaborate piping system. I present this for the benefit of "B. H. C.," and hope that other readers of *The Metal Worker* will comment on my system, or suggest others that they consider better, for the benefit of all who are interested in this branch of work.

CAN ALUMINUM CASTINGS BE SOLDERED?

From I. E. D., Atlantic, Iowa.—In answer to the inquiry of "E. S.," in *The Metal Worker* of February 22, I give the following aluminum solder, which I have used with satisfactory results: Mix block tin and sheet zinc half and half. Use as a flux rosin or paraffin wax. I think this will answer his purpose, as I solder common aluminum ware very readily with this compound.

HEATING CAPACITY OF A FURNACE PIPE.

From W. W., New York.—In a case of emergency would a 6-inch round tin hot air pipe, placed in a 7 x 7 terra cotta lined flue, be of sufficient capacity to heat a room 15 x 12 feet in a frame house having a bay window and exposed on two sides? If not, would not two such pipes and flues, joined at the top and bottom, work satisfactorily when both are perpendicular?

TRADE REPORT.

MARKET SUMMARY.

Pig Tin is firm and slightly higher, but dull.

Copper is quiet and unchanged.

Pig Lead is unchanged.

Spelter is dull aud without change.

Antimony shows no change.

Nickel is in good demand at former prices.

Aluminum is active and without change.

Tin Plates are firm and quiet.

Sheets are very strong aud demand urgent, on prospect of scarcity.

Sheet Copper is in good demand, and firm in price.

Scrap Iron is high in price, and in large demand.

Old Brass and Copper are moving freely, and are firm in price.

Foundry Iron is very strong, with high premiums for early deliveries and prospect of scarcity.

Hardware is moviug iu good volume, and prices, as a whole, show strength and steadiness.

Wrought Iron Pipe has been advauced in price 10 per cent.

Roofing Felt is active and strong, with tendency to advance.

Wire Nails are firmer and in better demand.

Cut Nails were advanced 5c. per keg for March.

Window Glass is uusettled.

White Lead is steady, with increased demand.

Linseed Oil is firm aud unchanged.

Spirits Turpentine is quiet but firm.

METAL MARKET.

NEW YORK, March 7, 1902.

Pig Tin.—Business in the Pig Tin market has been extremely quiet. The consumptive demand is light and speculative interest almost entirely absent. The market has advanced somewhat during the week, largely as the result of the stranding of the Steamship "Acara" from Singapore with about 5050 tons of Ore. Late reports, however, state that this cargo is likely to be recovered eventually. Jobbers' quotations for small lots of Straits Pig are about 26½c. to 27c. per lb. The total visible supplies, as compared with a month and a year ago, as compiled by the New York Metal Exchange, show:

	Tons.
Total visible supply February 28, 1902	17,043
Against visible supply January 31, 1902	18,351
Against visible supply February 28, 1901	17,016

Copper.—This metal has continued in a dull and uninteresting condition. The market appeared to soften during the early part of the week, but put on a better tone at the close. The demand from consumers has been extremely light, while holders are showing considerable willingness to sell. Jobbers' prices are unchanged, Lake Ingot in small lots beiug quoted at about 13¼c. to 13¾c. per lb., and Casting Copper at about 13¼c.

Sheet Copper.—The demand for Sheet Copper is referred to as of good volume, indicating a prospect for a large cousumption of the material this season. Prices rule firm on the basis of 18c. per lb. from store.

Pig Lead.—This metal is entirely unchanged. Business in this, as in other lines, has been hampered to some extent by the storms which have delayed deliveries from the West. American Pig in small lots is quoted at 4.45c. to 4½c. per lb. St. Louis advices report that the Pig Lead market at that center has lapsed into a quiet condition, although prices hold firm and steady.

Spelter.—Dullness characterizes the metal in this market. Demand is very light, and there is no pressure of offerings. Prices are unchanged, good Western brands in small lots being quoted at 4.60c. to 4.70c. per lb. St. Louis advices indicate a materially lessened demand for Spelter in that market, with very quiet conditions ruling and no change in price.

Sheet Zinc.—The demand for Sheet Zinc keeps up to about the average volume. Jobbers quote 600-lb. cask lots at 6¾c., and smaller quantities at 7¼c. per lb.

Antimony—Is unchanged. Hallett's is quoted at 8⅝c. to 8¾c. per lb. for small lots; U. S. at 8⅜c. to 8½c., and Cookson's at 10¼c. to 10¾c.

Nickel.—No change is noted in this market, small lots being quoted at about 55c. per lb.

Aluminum.—A good demand for this metal is reported. Prices remain at former level. Small lots of No. 1 Ingot guaranteed 99 per cent. pure are quoted at 37c. per lb., and 100-lb. lots at 35c. per lb.

Tin Plates.—The Tin Plate market presents a quiet and uninteresting aspect. Deliveries on old contracts are said to be heavy, but comparatively little new busiuess is reported. Some of the canners and Can makers still seem to be hesitating about placing their season's orders. The retail demand has been restricted during the week by the inclement weather, which has prevented out of door work and hampered communications. Prices are without change. American Bessemer Plates, IC, 14 x 20, in small lots, at New York and corresponding points, are selling at about $4.85 to $5 per box.

Sheets.—A heavy demand is noted for both Black and Galvanized Sheets. On account of the great difficulty experienced by some of the outside mills in getting Sheet Bars, it would not be surprising if prices of Sheets would advance when the spring trade opens actively. Deliveries throughout the country have been delayed by the interruption of floods. Most of the Sheet mills are understood to be sold up for the next three or four months. Prompt deliveries command slightly higher prices than contracts for extended shipment. Retail prices in this section are very firm. No. 27, One Pass Cold Rolled Soft Steel Sheets, beiug quoted in New York at 3.90c. to 4c., and Galvanized Sheets at 67½ and 5 per cent. to 70 per cent. off the list.

St. Louis advices are as follows: Busiuess in the market for Sheets of all grades is said to be of large proportions, and prices are on a firm basis. Jobbers quote Stove Pipe size, No. 27, at 3.60c. to 3.65c., and Galvanized Sheets, 70 to 70 and 5 off in round lots.

Old Metals.—Demand for Scrap Iron is still heavy and prices are strong. In other lines of Old Metal a good business is also being doue. Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper	per lb. 10¾c.
Light and Tinned Copper	per lb. 9 c.
Heavy Brass	per lb. 8¾c.
Light Brass	per lb. 6¼c.
Lead	per lb. 3⅝c.
Tea Lead	per lb. 3½c.
Zinc	per lb. 3 c.
Pure Aluminum, Sheet	per lb. 25 c.
Cast Aluminum	per lb. 20 c.
No. 1 Pewter	per lb. 15¾c.
No. 2 Pewter	per lb. 8 c.
Tin Plate Scrap, per gross ton	to $5.00
Wrought Iron Scrap, per gross ton	$13.50 to 14.00
Heavy Cast Scrap, per gross ton	12.50 to 13.00
Stove Plate Scrap, per gross ton	9.50 to 10.00
Burnt Iron, per gross ton	7.00 to 7.50

THE PIG IRON MARKET.

NEW YORK.—A number of sales of magnitude have taken place in this market. Some of the Northern furnaces have further advanced prices. We quote for Northern Irons: No. 1, $18.50 to $19; No. 2 X, $17.50 to $17.75; No. 2 Plain, $17 to $17.50, at tidewater; Tennessee and Alabama brands, No. 1 Foundry, $16.50 to $17; No. 2 Foundry, $16 to $16.75; No. 1 Soft, $16.50 to $17; No. 2 Soft, $16 to $16.50; No. 3 Foundry, $15.50 to $15.75; No. 4 Foundry, $15 to $15.50.

PHILADELPHIA.—There is no market in the ordinary sense of the word, consequently prices are almost impos-

sible to quote. Makers who have little Iron to spare can control their prices, and as a matter of fact buyers are not disposed to haggle about prices provided they can get material quickly. The continued strength of the market for the first half of the year has had a tendency to strengthen the feeling in regard to later dates, and while the Southern Ironmasters have not withdrawn from the market, they are certainly less free in their offers than they were a week or ten days ago. It may be said that the feeling all around is considerably stronger than it was a week ago, and it is not unlikely that present prices may average an advance of $1 per ton. A good deal depends, however, on deliveries. For the present the range of prices would be about as follows for city and nearby deliveries:

	Delivertes to July.	Delivertes July to December.
No. 1 X, Foundry	$19.25 to $20.00	$18.50 to $19.00
No. 2 X, Foundry	18.50 to 19.00	17.00 to 17.50
No. 2 Plain	17.75 to 18.25	16.50 to 17.00

PITTSBURGH.—The market has quieted down somewhat, and large purchasers of Pig Iron are using their utmost endeavors to hold the market where it is and keep prices from advancing. No. 2 Foundry Iron is quoted at $17 to $17.25, and No. 1 at $17.50 to $18, f.o.b. Pittsburgh.

CINCINNATI.—The amount of Pig Iron sold during the past week was comparatively small, and sellers are expressing themselves as glad of the change to make it easy for a short season. The amount of inquiry and especially for late deliveries has also very materially decreased. Prices are stationary. There are a few sellers asking and doing some little selling on basis as high as $13, Birmingham, for No. 2, but the real mark is on the basis of $12, with the exceptional grades at $12.50. The present lull is generally expected to last a week or two at least. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$15.25 to $15.75
Southern Coke, No. 2	14.75 to 15.25
Southern Coke, No. 3	14.25 to 14.75
Southern Coke, No. 4	13.75 to 14.25
Southern Coke, No. 1 Soft	15.25 to 15.75
Southern Coke, No. 2 Soft	14.75 to 15.25
Southern Coke, Gray Forge	13.75 to 14.25
Southern Coke, Mottled	13.75 to 14.25
Ohio Silvery, No. 1	17.75 to 18.25
Ohio Silvery, No. 2	17.25 to 17.75
Lake Superior Coke, No. 1	18.10 to 18.35
Lake Superior Coke, No. 2	17.60 to 17.85
Lake Superior Coke, No. 3	16.35 to 16.85

ST. LOUIS.—Sales in the Pig Iron market during the past week are somewhat lighter in volume, but the inquiry for quick delivery Iron continues to be quite pronounced and the offerings light. All of the Southern furnaces are practically sold up for the first half of the year, and many are heavily booked beyond that period. The severe floods in many sections of the South have greatly hampered plants and shipments have been delayed. Prices are on a firm basis, and we quote for cash, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry	$15.75 to $16.00
Southern, No. 2 Foundry	15.25 to 15.50
Southern, No. 3 Foundry	14.75 to 15.00
Southern, No. 4 Foundry	14.25 to 14.50
No. 1 Soft	15.75 to 16.00
No. 2 Soft	15.25 to 15.50

CHICAGO REPORT.

Scrap Iron and Steel.—Business is quiet in the Scrap Iron market and no change in prices since last week. We quote dealers' buying prices for carload lots, Chicago delivery, as follows:

	Per net ton.
Country Wrought Scrap	$14.00 to $14.50
Machinery Cast	13.00 to 13.50
Malleable Cast	12.00 to 12.50
Stove Plate (free from burnt)	10.00 to 10.50
Burnt Iron and Grate Bars	7.00 to 8.00
Sheet Iron and Hoops	8.00 to 8.50
Plow Steel	11.00 to 11.50
Breaking Stock	.... to 11.00
No. 2, such as Shovels, Hocs, &c	7.00 to 7.50
Old Boilers—whole (Iron)	9.00 to 9.50
Old Boilers (Iron) cut in single Sheets and Rings	12.00 to 12.50
Old Gas Pipes and Boiler Tubes	12.00 to 12.50
Cast Borings	6.50 to 7.00
Turnings	11.50 to 12.00
Horseshoes	14.00 to 14.50

Old Metals.—A fair demand continues and prices are maintained, with a slight advance in some metals. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	11 c.
Copper Bottoms	11 c.
Copper Clips	10 c.
Red Brass	11½c.
Yellow Brass	8 c.
Red Brass Borings	9 c.
Yellow Brass Borings	7¼c.
Light Brass	6 c.
Pipe Lead	3.50c.
Tea Lead	3.25c.
Zinc	2.90c.
Tin Foil	18 c.
Pewter, No. 1	16 c.
Pewter, No. 2	14 c.
Aluminum	20 c.

Old Rubber.—Conditions remain about the same, with a good demand and prices strong. Dealers' buying prices are as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	42.50	.....
Rubber Shoes	....	7 to 7½c.
Rubber Car Springs	....	5½c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6½c.
Black Rubber	....	4 c.
White Rubber	....	8¼c.

Rags.—Dealers quote buying prices of good Country Mixed Rags, Chicago delivery, at 75c. to 85c. per 100 lbs. in any quantity.

Anthracite Coal.—Market is very quiet, as the weather is still moderate. Prices are unchanged, as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis	5.75	6.00
St. Louis	6.20	6.45
Kansas City, Mo	8.25	8.50

THE HARDWARE TRADE.

The prevalence of severe weather has in more than one way interfered with the transaction of business during the week under review. Besides the interruption of the ordinary outdoor occupations, which has the immediate effect of diminishing the volume of business throughout the country, there has been uncertainty and delay in the movement of passengers and freight, with corresponding interference with connection by mail or telegraph. The extent to which production is being interrupted cannot as yet be definitely estimated, but it is evident that the matter is a serious one for many plants whose operations have been stopped by the high water, with injury in some cases to their outfit or manufactured products. It is not unlikely that in this way some of the mills will be put still further back in the work of filling orders, thus accentuating the difficulty in obtaining raw material or finished goods. While these influences will have a depressing effect so far as the immediate business of the country is concerned, they tend to give indirectly firmness to values and to strengthen the situation so far as the future outlook is concerned. The changes in the price of Hardware and related products are unimportant. A few goods are from week to week being advanced and the general tone is steady and confident. The subject of consolidation continues to be a trade topic in a serious or speculative way. The recent consolidations in Axes and Builders' Hardware are being canvassed in the light of the advantages thus secured by the parties whose interests are immediately affected, and the wisdom of the action taken is generally conceded. The qustion as to how much further in this or in other lines the movement may go is regarded with a good deal of interest by the trade, especially as it is understood that negotiations to have certain lines of Edge Tools taken in with Axes are in progress. Meanwhile the trade recognize the fact that in practically all the lines in which consolidation has been effected one of its results has been the development of competition, so that the elimination of competition by this means is apparently as remote as ever.

NOTES ON PRICES

Wrought Iron Pipe.—On March 1 the price of Wrought Iron Pipe, Black and Galvanized, was advanced 10 per cent. While no official discount sheet has been issued up to the present time, it is understood that all extras have been lopped off and that the pres-

ent Pittsburgh basing price on Wrought Iron Pipe for jobbers' carloads is as follows:

Size.	Black. Per cent.	Galvd. Per cent.
⅛ to ½ inch	62	50
¾ to 12 inch	69	57

These are the base discounts f.o.b. Pittsburgh, Pa. These, we are told, are the prices at which the National Tube Company are making sales at the different plants operated by them. The new base discounts show an advance of 10 per cent. upon the previous mill prices, which have been in effect since September 1, 1900. At the time the base discounts were adopted there was no extra rebate allowed by the then controlling interest, but as time went on and one independent mill after another went into operation, until the independents represented some 65 per cent. of the output of Pipe, they were compelled to adopt a more liberal selling policy. At the present time the market would be in the hands of the independents were it not for the fact that control of the market for raw material is in the hands of the United States Steel Corporation, who are keeping prices for Skelp at such a high level that it will be impossible for the outsiders to cut prices very much.

At a meeting of the New York jobbers held on March 4 the following local prices on Wrought Iron Pipe were adopted:

	Black. Per cent.	Galvd. Per cent.
⅛ to ½ inch	60	45
¾ to 12 inch	67	55
Extra Heavy Pipe, plain ends	50	40
	Per cent.	
Double Extra Heavy Pipe	20	

To cover sales from stock in Greater New York, Long Island and for export.

Roofing Materials.—The season has opened with prospects of large trade in Roofing Materials. The demand is referred to as active and prices are very strong with tendency to advance, especially in the line of Roofing Felts.

Wire Nails.—An improvement in the demand for Wire Nails is reported in the New York market and prices show increased firmness. Small lots from store are quoted at $2.25 to $2.30 per keg. High water has seriously interfered with the production of Nails at some of the mills.

Cut Nails.—The meeting of the Cut Nail Association, held March 4, advanced prices 5 per cent. for the month of March. Cut Nails are meeting with a comparatively light demand in the New York market, where small lots from store are quoted at $2.20 to $2.25 per keg.

Window Glass.—Both the large and small trade are ordering only sufficient stocks for immediate needs, owing to fear of lower prices later in the season. The quotation of the Jobbers' Association for Window Glass from store is 90 and 10 per cent. discount.

White Lead.—Orders for March and forward delivery for White Lead in Oil are reported to be increasing, and the market is somewhat steadier. A satisfactory demand is anticipated for the spring. Lots of less than 500 pounds are quoted at 6½ cents per pound, and smaller quantities at 6¾ cents.

Linseed Oil.—Weather conditions during the week have interfered with the shipping, and consumption of Oil to a considerable extent. The demand at this point has been limited. The local market is firm, City Raw in small lots being quoted at about 64 cents per gallon, and out of town Raw at 63 cents.

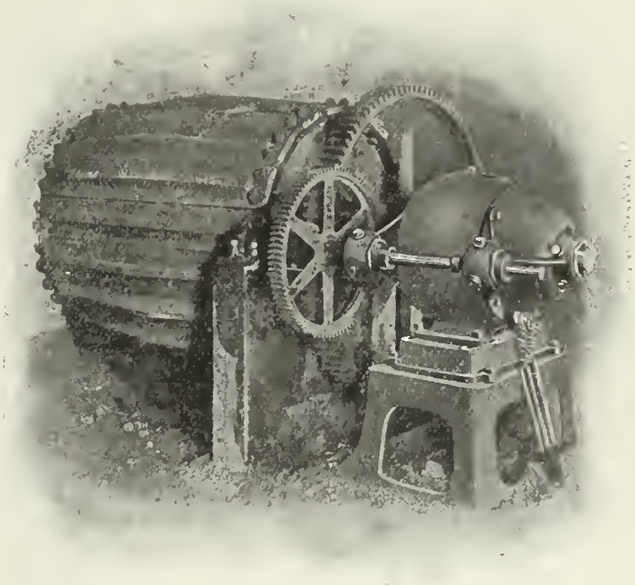
Spirits Turpentine.—The local market has ruled quieter during the week, buying being confined to immediate requirements. Prices are firm at 45½ to 46 cents per gallon for Turpentine in retail lots.

The Electric Tower of the Pan-American Exposition has been sold to parties in Denver, Col., and it is to be taken down and shipped to that city, where it is to be reerected in a park. When rebuilt the outer covering will be of more substantial material than the present staff, and it is intimated that it will be fully illuminated when installed in Denver. Thus the great and notable attraction of the defunct Pan-American is destined to form a wonderful attraction in the far West. Its hight has been given all the way from 375 to 408 feet. It was designed by John Galen Howard of New York. It is expected that it will take about 30 days to raze it.

The Northern Electric Motor.

In the accompanying illustration we show the Northern electric motor made by the Northern Electrical Mfg. Company of Madison, Wis., connected to drive a foundry rattler. These motors are cast from a fine grade of soft steel, having a very high magnetic permeability, without a joint of any kind, thereby insuring a perfect magnetic circuit. The field coils are accurately formed of insulated copper wire wound evenly and compactly by automatic machinery. Insulation of the coils as well as protection from mechanical injury has been so well guarded that they are claimed to be practically impervious to water or oil.

The armatures are of the usual iron clad type, the core being built up of thin annealed soft steel disks, correctly punched and notched for the reception of the bars or coils. Each disk is insulated on both sides, and assembled on a spider, which is designed to facilitate a free and abundant circulation of air. The core is put under great pressure, bringing the disks into a solid, compact mass, yet perfectly laminated.



Northern Electric Motor Driving Rattler.

Particular attention is paid to the insulation between the segments of the commutators. Nothing but the best mica is depended upon for this important work. The segments are forged from pure copper, uniform in density and having the grain or flow in the direction of length, so as to secure a smooth, durable surface.

The coils are form-wound of wire or bar copper, according to the size of the machine. Each coil is made from a single length of copper and is inclosed in an insulating cell. The slots of the armature core are lined with a layer of insulating material before the bars are laid in place so that there is no chance of a "ground" or fault developing at this point.

The bearings are either of bronze or babbitt metal, according to the size of the machine. The arrangement is such that in no event is it possible for the armature to drop against the pole pieces and become damaged. Each bearing is spherically seated, making it self adjusting and self aligning.

Interposed between the motor shown and the rattler is a train of gears for reducing the speed. The dust proof qualities of this motor peculiarly adapt it for use in running the machinery in a foundry casting cleaning room, while it is suitable for a variety of uses where power is required.

Foundry Costs.

One of the last bulletins issued by the American Foundrymen's Association contains an article on foundry costs, from which we reprint the following:

Those of our foundrymen who are accustomed to careful records in their works, in order to detect any possible leaks or insufficient economy, will be interested in the following table showing the cost of 100 pounds of castings made during the fiscal year ending June, 1901. For obvious reasons no names are given. The original, printed in the bulletin, gives the figures for every month of 1901. We print below the averages for a series of years:

	Foundry Costs.			
Cost of materials:	1901.	1900.	1899.	1898.
Metals	0.7694	0.8479	0.4942	0.4589
Melting	0.0436	0.0453	0.0380	0.0368
Molding	0.0080	0.0072	0.0063	0.0062
Cores	0.0161	0.0138	0.0123	0.0138
Salaries	0.4729	0.4550	0.4172	0.4346
Misc. expense	0.0583	0.0514	0.0417	0.0482
Cost per 100 lb. castings	1.3683	1.4206	1.0097	0.9985
Weight of good castings	17,802,844	21,965,408	23,562,841	20,117,909
Defective castings, per cent	2.8	2.2	2.1	2.5

For a series of years the cost was as follows:

Cost per 100 Pounds Castings.

Average.	Average.	Average.
1897.....1.0866	1892.....1.2892	1887.....1.6900
1896.....1.1469	1891.....1.3457	1886.....1.5600
1895.....1.1332	1890.....1.4611	1885.....1.5900
1894.....1.1442	1889.....1.4842	1884.....1.8200
1893.....1.2687	1888.....1.5320	1883.....1.8700

This foundry does general jobbing work and makes car wheels.

Electroplated Doors.

A method of producing a wooden door which is thoroughly inclosed in metal without visible seams, thus giving it the appearance of a solid door, has been developed by an inventor in Bridgeport, Conn. This is accomplished by a process of electroplating the wooden doors with copper, brass or other metals, thus especially adapting them for use as entrance doors to flats or other large and expensive buildings where massive and elaborate effects are sought. Such doors are considered a valuable adjunct in preventing the rapid progress of fire, and metal protected doors are frequently used in theaters.

There is no necessity of burning off the varnish in order to revarnish, as is necessary with the old methods of covering or protecting. The finished wooden doors are first filled with a wood filler as, for instance, a mixture of linseed oil and resinous gum, which is designed to waterproof and protect the wood thoroughly and prevent warping. The doors are placed in a tank filled with the heated filler, which is kept hot by steam. After the filler has thoroughly penetrated the wood they are lifted out and permitted to drain off, after which they are laid on a table for further applications. The door is then rubbed smooth and coated with a varnish, as shellac, and is then dried. This operation is continued until the desired surface is obtained. The edges of the door are trimmed with sheet metal strips corresponding to the width of the door, being attached to the four edges by means of nails, screws or cement. The material used for the strips is preferably copper, bronze or brass. The face of the strip on the edge of the door is covered with a metallic insulating varnish, after which the entire door is coated with a metal substance, such as thin metallic leaf, metallic brass powder or common varnishing wash, with plumbago. When the coatings applied have become dry the door is rinsed and is ready to receive the electric deposit. The door is supported in a vertical position in the plating bath. One wire goes to the anode, and the second wire is preferably attached to the metal strip on one edge of the door; the current is then turned on, and the electrolytic action takes place until the surface is covered to any desired thickness.

The advantage obtained by covering the edges of the door with a sheet metal strip is that its high conducting power makes a complete circuit around the door, and the width of the strip insures an even and unbroken surface between the two sides.

The sale of the buildings of the Pan-American Exposition has at last been completed, the Chicago House Wrecking Company having purchased them for $80,000. Possession of the property has been given to the buyers, and the work of tearing down the buildings is to commence at once. The figure of the Goddess of Light, that occupied the apex of the electric tower, has been sold to David Humphrey, a popcorn vender of Cleveland, Ohio, and is to be removed to that city, where it is destined to occupy a position on top of a popcorn pavilion at Euclid Beach Park. How have the mighty fallen! Charles T. Harris of the Chicago Wrecking Company is quoted as expressing a belief that all of the steel beams and the iron work has been sold. Several parties have been after it. Some of it may go to St. Louis, while other parts will be used in small halls.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED MARCH 7, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 37¢
100-lb lots.....₩ lb, 35¢

Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19.....	$0.42	$0.44	$0.47
" 20.....	.44	.46	.49
" 21 to 23.....	.46	.48	.51
" 24.....	.46	.50	.53
" 25.....	.47	.51	.54
" 26.....	.47	.54	.59
" 27.....	.48	.57	.62
" 28.....	.48	.57	.64
" 29.....	.49	.60	.69
" 30.....	.50	.64	.77

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb, 10¼@10¾¢
Hallett's.....₩ lb, 8⅜@8¾¢
U.S.....₩ lb 8⅜@8¾¢

Brass, Roll and Sheet.....30%

Conductors—Corrugated.

Round or Square.—

Galvanized ½ or more, N'st'd.....70&5%
" Not Nested.....70&2½%
" Plain Round, ½ or more, Nested.....70&5%
Galvanized, Plain Round, Not Nested. 70&2½%

Spiral Riveted.

Galvanized.....40%
See also Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.

Conductor Strainers—

See *Strainers, Conductor.*

Copper—

Lake Ingot.....13¾@14 ¢
Casting.....13½@13¾¢
Sheet and Bolt.....18¢ ₩ lb basis
Cold Rolled Sheets.....19¢ ₩ lb basis
Cold Rolled and Polished Sheets.....20¢ basis
Planished Sheets.....21¢ basis
Bottoms, Pits and Flats....₩ lb 22¢ basis

Eave Trough Galvanized

Territory.	L. C. L.
Eastern	75&10%
Central	75&7½%
Southern	70&12½%
S. Western	70&10%

Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Eastern List.

Tin.....30%
Galvanized.....30%
Perfect Elbows.....40%

Stove Pipe—

Four-Piece

	4	4½	5	5½	6-inch.
No. 1.	$0.80	.85	.90	1.00	1.05 per doz.
No. 2.	.65	.70	.75	.80	.85 "
No 3.	.60	.63	.65	.70	.80 "

Elbows and Shoes—

Galvanized.....60%

Gasoline—

See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, C. R., Soft Steel.	R. G. Cleaned.
Nos. 14 to 16....	₩ lb. 3.60....	3.85¢
Nos. 18 to 21....	₩ lb, 3.70....	3.75¢
Nos. 22 to 24....	₩ lb, 3.80....	3.85¢
Nos. 25 and 26...	₩ lb, 3.90....	3.95¢
No. 27	₩ lb, 4.00....	4.05¢
No. 28	₩ lb, 4.10....	4.15¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb 11@14 ¢
Do. Stained.....6@10½¢
Patent Planished. ₩ lb A, 12¢; B, 11¢ net

Galvanized.

Nos. 10 to 16.....	₩ lb, 12¢	50 & 5%
Nos. 17 to 21.....	₩ lb, 13¢	
Nos. 22 to 24.....	₩ lb, 14¢	
Nos. 25 to 26.....	₩ lb, 15¢	
No. 27.....	₩ lb, 16¢	60 & 5%
No. 28.....	₩ lb, 17¢	
No. 29.....	₩ lb, 19¢	
No. 30.....	₩ lb, 21¢	

36 in. 1¢ ₩ lb higher.

Lead—

American Pig.....4.45@4½¢
Bar.....5 @5½¢
Pipe.....6½¢.....2% off
Tin Lined Pipe.....12½¢.....20% off
Block Tin Pipe.....35 ¢.....20% off
Sheet Lead.....7¼¢.....20% off
Old Lead in exchange, 3¼¢ ₩ lb.

Mitres, Eave Trough—

See *Eave Trough Mitres.*

Nickel—

Per lb.....55@60¢

Paints, Oils, &c.—

Leads—

Lead, American White, in Oil:
Lots of 500 lb or over.....6¼ @ 6¼
Lots less than 500 lb.....6½ @ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price..... @ ¼
Lead, White, in oil, 13½ lb tin pails, add to keg price..... @ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price... @ 1¼
Lead, White, Dry in bbls.....5¾ @ 6
Lead, Red, bbls., ½ bbls. and kegs:
Lots 500 lb or over..... @ 6
Lots less than 500 lb..... @ 6¼

Oils—

Linseed, City, raw.....₩ gal..... 64¢
Linseed, City, boiled..... 66¢
Linseed State and West'n, raw..... 63¢

Spirits Turpentine—

In Southern bbls.....45½@46 ¢
In machine bbls.....40½@47 ¢

Putty—

In bulk.....$1.25
In bladders..... 2.25
In cans 12 lb to 25 lb..... 2.25
In cans 1 lb to 5 lb..... 3.25

Petroleum Products—

In Barrels (Barrel included)

Stove Gasoline.....₩ gal. 10½@11¢
Kerosene.....₩ gal. 12@13¢

Pipe, Drain.....40%

Pipe, Spiral—

See *Conductors.*

Registers—

List Sept. 2, 1901.

Black Japanned.....60&10@60&10&5%
White Japanned.....60&10@60&10&5%
Nickel Plated.....60&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....60&10@60&10&5%
Electroplated in Brass, Bronze or Copper.....60&10@60&10&5%
White Porcelain.....60%
Solid Brass and Bronze Metal.....50%

Roofing Material—

1 Ply Tarred Paper.₩ ton.$30.00@31.00
2 Ply Tarred Paper...₩ roll, 108 sq. ft. 50@55¢
3 Ply Tarred Paper..₩ roll, 108 sq. ft. 70@75¢
Slater's Felt.....roll 500 sq. ft., 50@60¢
Roofing Pitch.....₩ bbl. $2 38

Rosin—

Common and Good—Strained.
Rosin, C. & D.....₩ bbl. $1.55 @$1.60
Rosin, E. & F.....₩ bbl. 1.60 @ 1.65
Rosin, G. & H ....₩ bbl. 1.70 @ 1.75
Rosin, I. & K.....₩ bbl. 1.95 @ 3.60
Rosin, M. & N.....₩ bbl. 3.00 @ 3.60

Shoes and Elbows—

See *Elbows and Shoes.*

Slate Roofing—

f. o. b. cars, Quarry Station.

	According to size.
Pennsylvania:	
Best Bangor, ₩ sqr.	$3.25@$4.50
No. 1 Bangor Ribbon. ₩ sq	3.00 @ 3.50
Pen Argyle. ₩ sqr.	3.00 @ 3.75
Peach Bottom. ₩ sqr.	4.85 @ 5.60
No. 1 Boys, ₩ sqr.	3.35 @ 3.55
No 1 Chapman Keystone. ₩ sqr	3.25 @ 4.25
Vermont:	
Sea Green. ₩ sqr.	$2.00@$3.25
Purple, ₩ sqr.	3.75 @ 4.25
Unfading Green, ₩ sqr.	3.25@ 4.50
Red, ₩ sqr	7.00@11.00
Maine:	
Brownville, Unfading Black:	
No. 1 quality	$5.25@7.50
No. 2 quality	$4.25@6.00

Solder—

½&½ guaranteed.....17@17½¢
No. 1.....14½@16¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	—Per Pound.— Barrels	Smaller Q'tities
Concentrated Flux	4c	5c
Eureka Flux:		
Triple Strength	3c	3½c
Extra Concentrated	4½c	5c
Crystal	..	7c
Gedney's Fluid	2c	2c
Lennox Fluid	2c	3c
Perfection Flux	3c	3½@4c
Yager's Salts, 1 lb. bottles		each, 50¢
5 lb. bottles, per lb., 45¢		

Soldering Coppers—

Per lb.....20@22¢

Spelter—

Western Spelter.....4.60@4.70¢

Spiral Pipe—

See *Conductors.*

Stove Pipe Elbows—

See *Elbows, Stove Pipe.*

Stove Trucks—

See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....50%

Tin Pigs and Bars—

Banca, pigs, ₩ lb.....26½@27 ¢
Straits, pigs, ₩ lb.....26½@27 ¢
Straits, in bars, ₩ lb.....27½@28 ¢

Tin Plates, American Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:
IC, 14 x 20.....$7.50
IX, 14 x 20.....9.00
IXX, 14 x 20.....10.25
IXXX, 14 x 20.....11.50
IXXXX, 14 x 20.....12.75

Melyn Grade:
IC, 14 x 20.....7.00
IX, 14 x 20.....8.50
IXX, 14 x 20.....9.75
IXXX, 14 x 20.....11.00
IXXXX 14 x 20.....12.25

Allaway Grade:
IC, 14 x 20.....6.50
IX, 14 x 20.....7.60
IXX, 14 x 20.....8.70
IXXX, 14 x 20.....9.80
IXXXX, 14 x 20.....10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight } IC, 14 x 20.....$4.90@5.00
" " IX, 14 x 20.....$6.00

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:
100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates—

N. B.—The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance for 8 to 10 lb coating and $2.50 to $3 advance for 15 lb and upward.

About 40 lb coating.....$16.00@16.50
About 30 lb coating.....15.25@15.75
About 20 lb coating.....13.25@13.75
About 15 lb coating.....11.25@11.75
About 8 lb coating.....@10.00

Boiler Plates, American—

1XX, 14 x 26..(112 sheets).....$12.50
1XX, 14 x 28..(112 sheets).....13.50
1XX, 14 x 31..(112 sheets).....15.00

Troughs, Eave—

See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved pattern, ₩ doz...18.00

Tubes and Tubing—

Brazed Brass, List June 6, 1898.....40%
Copper and Bronze, 3c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb. 6, 1899
Tin.....50%
Galvanized.....50%
Fittings for do.....40%

Zinc—

600 lb casks ₩ lb.....6¾¢
Per lb.....7¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
30 gal.....70&10%
35 and 40 gal.....70%
Other sizes up to 52 gal....60@60&10%
52 gal. and above.....60%
Extra Heavy Boilers:
18 to 52 gal.....60%
53 gal. and above.....55%

Brass Work, Plumbers'—

List of December 7, 1896.

Compression:
Basin Cocks.....65%
Bath Cocks and Double Bath Cocks.. 65%
Bibs.....65%
Fibs, Flanged.....65%
Fuller:
Bibs.....70%
Basin Cocks, Nos. 1 to 4.....70%
Bath Cocks, No. 4½.....$2.40 each net
Ground Key Work:
Finished Bibs.....55&5%
Rough Bibs.....70%
Rough Stop and Stop and Waste Cocks.....70@70&5%
Rough Stop and Stop and Waste Cocks, Patented.....65@65&5%

Miscellaneous—

Basin Clamps.....60@65%
Basin Plugs.....60@65%
Chain Stays.....60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face..₩ set	$0.95	$1.05
Ground Face ₩ set	$1.00	$1.10

Sink or Bath and Wash Tray Plugs.60@65%
Soldering Nipples.....70&5@75%
Soldering Unions.....70&5@75%
Union Elbows, Hot Water Heating.... 75@75&15%

Cocks, Valves, &c.—

Cocks—

Brass—

Air and Radiator Air.....75@75&5%
Gas Meter and Union Meter.....65@70%
Steam.....65@70%

Iron—

All Iron.....70@70&10%
Iron with Brass Plugs.....65@70%

Valves—

Brass—

Check.....65@70%
Garden Hose.....65&10@70%
Gate.....65@65&10%
Globe and Angle, hose outlet.65@65&10%
Globe, Angle and Cross..65&10@70&5%
Horizontal, Vertical and Angle Check... 65@65&10%
Hot Water Radiator.....75%
Radiator.....70&10%
Safety.....65%
Safety, Low Pressure.....65%
Jenkins' Disc:
Check.....65%
Gate.....65%
Globe, Angle and Cross.....70%
Radiator.....80%
Radiator, Corner.....75%
Safety.....65%

Iron—

Iron Body.....70@70&5%
Foot.....65@70%
Jenkins Bros.':
All Iron, except Gate.....40&5%
All Iron Gate.....35@40%
Iron Body, except Gate.....60%
Iron Body Gate.....50@50&5%
Swing Check.....50%

Earthenware—

Brown Glazed Wash Tubs.....20%
Brown Glazed Sinks, Kitchen and Pantry.....20%
Basins, Urinals and Hoppers.....45%
Closet Bowls, Sundries, Washouts and Pedestals.....50%

Fittings—

Brass Fittings—

Finished.....70@75%
Rough.....70@75%
Bushings.....70@75%
Nipples.....70@70&2½%
Unions, Rough and Finished....70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....65@70%
Cast Iron Bushings and Plugs....65@75%
Cast Iron Flanges.....65@70%
Cast Iron Floor Flanges.....65@75%
Malleable Iron Fittings.....70@75%
" " Bushings.....70@70&10%
" " Unions.....70&10@75%
" " Unions, Flange 60&10@70%
" " Pipe Hangers, Universal 50%
Wrought Iron Nipples.....70@75%
" " Couplings.....60@65%
" " Long Screws.....60@65%

Lavatories—

Porcelain Enameled Iron.....30@30&10%

Oakum—

Plumbers' Oakum, 50 lb. bales, ₩ lb 2½¢

Pipe—

Brass, Iron Pipe Size—

⅛	¼	⅜	¾ to 3 Inch
$0.38	.31	.29	.23 ₩ lb

Cast Iron Soil—

List Feb. 25, 1901.
2 to 6 inch inclusive.

Standard.....50&10%
Extra Heavy.....65%
All Fittings.....70%

Wrought Iron—

List Feb. 15, 1900.

	Black.	Galv.
⅛ to ½ inch	57%	43%
¾ to 12 inch	64%	51%

Radiators—

Standard List.

Steam.....50&2½%
Hot Water.....50%

Sinks, Etc.—

Cast Iron—	Black.	Galv.
Sinks, Square, Half Round and Corner	60@65%	60@65%
Sink Legs	60%	60@65%
Sink Backs	60%	60@65%
Boiler Stands, Cast Iron	60@60&10%	
Cesspools, Cast Iron	60%	

Wrought Steel Sinks—

New Era, Galv'd and Enameled...70&5%
New Era, Painted.....50&10%
L. & G.....50%

Traps—

Drawn Lead Traps, List June 3, 1901..... 50&5%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns, Guaranteed, 45@50%
All Special Patterns.....25%
Non-Guaranteed Brands, complete line.....45@50%
Solid Copper, list of Feb. 1, 1899.....40%
Solid Porcelain—Class A, 30%; B, 40%; C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899.....50@55%

CLASSIFIED LIST OF ADVERTISERS.

Acetylene Gas Generators.
International Heater Co., Utica, N. Y.

Agate Nickel-Steel Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Aluminum Ingots.
Janney, Steinmetz & Co., Phila., Pa.

Aluminum Scrap Buyers.
Janney, Steinmetz & Co., Phila., Pa.

Aluminum Sheets.
Janney, Steinmetz & Co., Phila., Pa.

Architectural Ornaments.
Edwards Mfg. Co., Covington, Ky.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, O.

Ball Cocks
Foster, F. W. Mfg. Co., Boston, Mass.

Bathtubs.
Day Metallic Mfg. Co., Detroit, Mich.

Black Plates.
American Tin Plate Co., New York.
Taylor, N. & G. Co., Phila., Pa.

Blast Gates.
American Blower Co., Detroit, Mich.

Blowers.
American Blower Co., Detroit, Mich.

Boiler Handles.
Berger Bros. Co., Phila., Pa.

Boilers
Mueller, L. J. Furnace Co., Milwaukee, Wis.

Boilers, Range.
Koven, L. O. & Bro., 50 Cliff St., N. Y.

Brass Goods
Jenkins Bros., 71 John St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

Castings, Iron.
Taylor & Boggis Foundry Co., Cleveland, O.

Ceilings, Metallic.
Berger Mfg. Co., Canton, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Coal Vases.
Cincinnati Stamping Co., Cincinnati, Ohio.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
American Steel Roofing Co., Middletown, O.
Berger Bros. Co., Philadelphia, Pa.
Clark, Quien & Morse, Peoria, Ill.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
McClure & Co., Pittsburgh, Pa.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Dreis, Andrews & Krump, Chicago, Ill.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Machine & Tool Works, Buffalo, N. Y
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Co., Cleveland, O.
Mullins, W. H., Salem, O.

Couplings. (*See Pipe Couplers.*)

Cut Offs, Rain Water.
Cooney & Geiger, Indianapolis, Ind.

Dampers.
Shields, W. H. & Co., Troy, N. Y.
Stover Mfg. Co., Freeport, Ill.
Taylor & Boggis Fdry. Co., Cleveland, Ohio.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Curtis & Curtis Co., Bridgeport, Ct.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y
Toledo Mach. & Tool Co., Toledo, O

Dryers.
Sommer's, John Son, Newark, N. J.

Dumb Waiters.
Energy Elevator Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Reeves Mfg. Co., Canal Dover, O.

Eave Trough Hangers.
Berger Bros. Co., Phila., Pa.
Berger Mfg. Co., Canton, O.

Elbows, Stove Pipe.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Shepard, Sidney & Co., Buffalo, N. Y.

Electric Dynamo Machines.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. Twenty-fifth St., New York.

Emery Wheels.
Scranton Corundum & Emery Wheel Co., Scranton, Pa.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Exhausters.
American Blower Co., Detroit, Mich.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Fire Pots.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Detroit, Mich.

Fire Sets.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Furnace Cement.
Perkins, J. L. & Co. Chicago.
Rutland Fire Clay Co., Rutland, Vt.

Furnace Pipe and Fittings.
International Heater Co., Utica, N. Y.
Osborn, J. M. & L. A., Cleveland, O.

Furnaces and Heaters.
Amer. Furnace Co., St. Louis, Mo.
Barstow Stove Co., Providence, R. I.
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bonnot Co., Canton, O.
Brand Stove Co., Milwaukee, Wis.
Bulen Heater Co., Hoosick Falls, N. Y.
Cory, Uzal & Co. 210 Water St., N. Y.
Dighton Furnace Co., Taunton, Mass.
Floyd, Wells & Co., Royersford, Pa.
Graff Furnace Co., 208 Water Street, New York.
Hart & Crouse Co., Utica, N. Y.
Hess-Snyder Company, Massillon, Ohio.
International Heater Co., Utica, N. Y.
Kelsey Heating Co., Syracuse, N. Y.
Lennox Manufacturing Co., Marshalltown, Iowa.
Magee Furnace Co., Boston, Mass.
Moucrief Furnace & Fdry Co., Atlanta, Ga.
Mueller, L. J. Furnace Co., Milwaukee, Wis.
Peck Williamson Co., Cincinnati, O.
Richmond Stove Co., Norwich, Conn.
Robinson Furnace Co., Chicago, Ill.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Ct.
Stanton Heater Co., Martius Ferry, O.
Tubular Heating and Ventilating Co., Phila., Pa.
Utica Heater Co., Utica, N. Y.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Granite Steel Ware.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Groovers.
Wheeler, W. A., Indianapolis, Ind

Gutter Formers.
Double Truss Cornice Brake Co., Buffalo, N. Y.

Heaters, Steam and Hot Water.
Barstow Stove Co., Providence, R. I.
Dighton Furnace Co., Taunton, Mass.
Drake, W. H., Newark, N. J.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
International Heater Co., Utica, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Magee Furnace Co., Boston, Mass.
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Smith, H. B. Co., Westfield, Mass.
Smith & Anthony Co., Boston, Mass.
Smith & Thayer Co., Boston, Mass.
Stolz, Frank D., Chicago, Ill.
Utica Heater Co., Utica, N. Y.
Vance Boiler Works, Geneva, N. Y.
Wireton Heating Co., Blue Island, Ill.

Hollow Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
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Sperry, D. R. & Co., Batavia, Ill.

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Clad, V. & Sons, Philadelphia, Pa.
Seavey Mfg. Co., Boston, Mass.

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Amer. Sheet Steel Co., New York.

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Schratwiesers Metal Lath Works.

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Colwell Lead Co., 63 Centre St., N. Y.

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Littleford Bros., Cincinnati, O.

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Signal Mail Box Co., Joliet, Ill.

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Palermo Mica Co., 115 Beekman St., N. Y.
Rutland Fire Clay Co., Rutland, Vt.

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National Enameling & Stamping Co., 78 Beekman St., N. Y.

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Zucker & Levett & Loeb Co., 526-530 W. Twenty-fifth St., New York.

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Excelsior Tool & Mch. Works, St. Louis, Mo.
Keene Geo. C. & Co., Cincinnati, O.

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Colwell Lead Co., 68 Centre St., N. Y.

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Galt, Jno. & Sons, 258 Broadway, N. Y.
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McClure & Co., Pittsburgh, Pa.
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Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
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Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

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Enterprise Stove Co., Vincennes, Ind.
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Hess-Snyder Company, Massillon, O.
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Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, O.
Shepard, Isaac A. & Co., Phila., Pa.
Smith & Anthony Co., Boston, Mass.
Stamford Foundry Co., Stamford, Ct.
Weir Stove Co., Taunton, Mass

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Graff Furnace Co., 208 Water Street, New York.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

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National Vapor Stove & Mfg. Co. Lorain, O.
Rathbone, Sard & Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
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Standard Lighting Co., Cleveland, O.
Taylor & Boggis Foundry Co., Cleveland, O.

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Peck, Stow & Wilcox Co., 27 Murray St., New York.
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McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

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Vulcan Metal Refining Co., 157 Cedar St., N. Y.
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Marston, L. G. & Co., Boston, Mass.

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Colwell Lead Co., 63 Centre St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Water Fronts.
Clark, Henry N. Co., Boston, Mass.

Water Heaters.
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Man who is a first-class TINSMITH and can also do plumbing; nine-hour day; state wages and experience. Spratt & Corcoran, Watertown, N. Y. Mar. 8

A thoroughly competent FOREMAN to take charge of small smelting plant for the manufacture of spelter from scrap; give full particulars, stating experience and salary expected. "Spelter," care *The Metal Worker*, New York. Mar. 8

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A first-class SALESMAN to handle a line of steel ranges, malleable, as a side line on commission; must command good trade; state territory covered and references. Box 34, care *The Metal Worker*, 1205 Fisher Building, Chicago, Ill. Mar. 8

A FOLLOW BOARDER for range and furnace work; give references. "Range," care *The Metal Worker*, New York. Mar. 8

A working FOREMAN to take charge of a tin and cornice shop; must be capable of detailing, cutting and constructing galvanized iron cornice and skylights, tin roofing, job work and hot air heating; state age and what wages wanted; steady work to the right man or an interest in a well established business after a satisfactory trial, should applicant so desire; must be temperate. Adolf Gehri, 1113 Tacoma avenue, Tacoma, Wash. Mar. 8

TINNER: a WORKING FOREMAN capable of taking charge of tinning plant; expert on tinning sheet steel, malleable and wrought iron; state experience. "Foreman Tinner," care *The Metal Worker*, New York. Mar. 8

A first-class TINNER; one who understands all kinds of shop and furnace work; preference given to man who can do slating; good wages and steady work. Brucks & Krantz, Canal Dover, Ohio. Mar. 8

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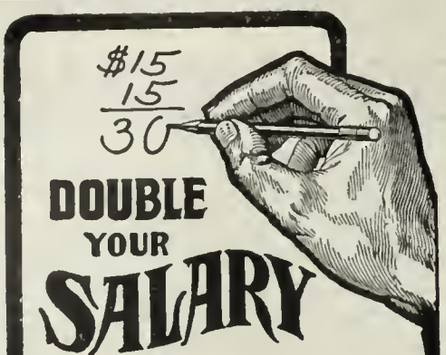
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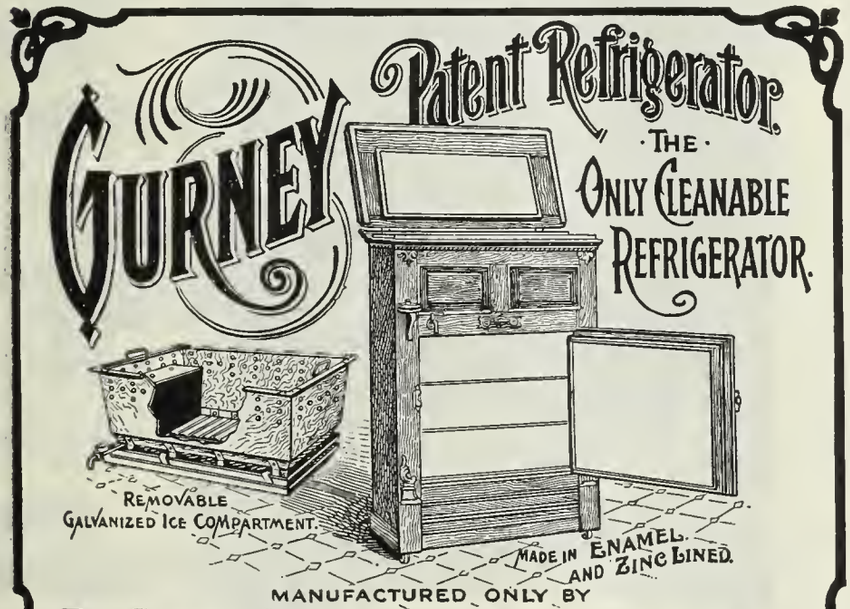
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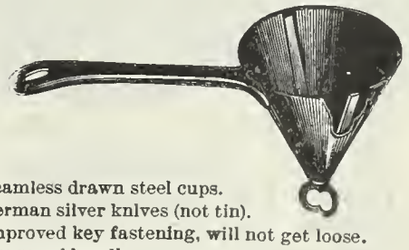
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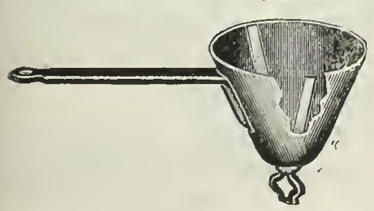
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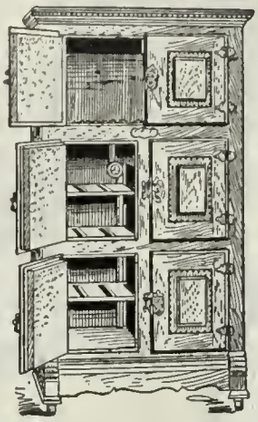
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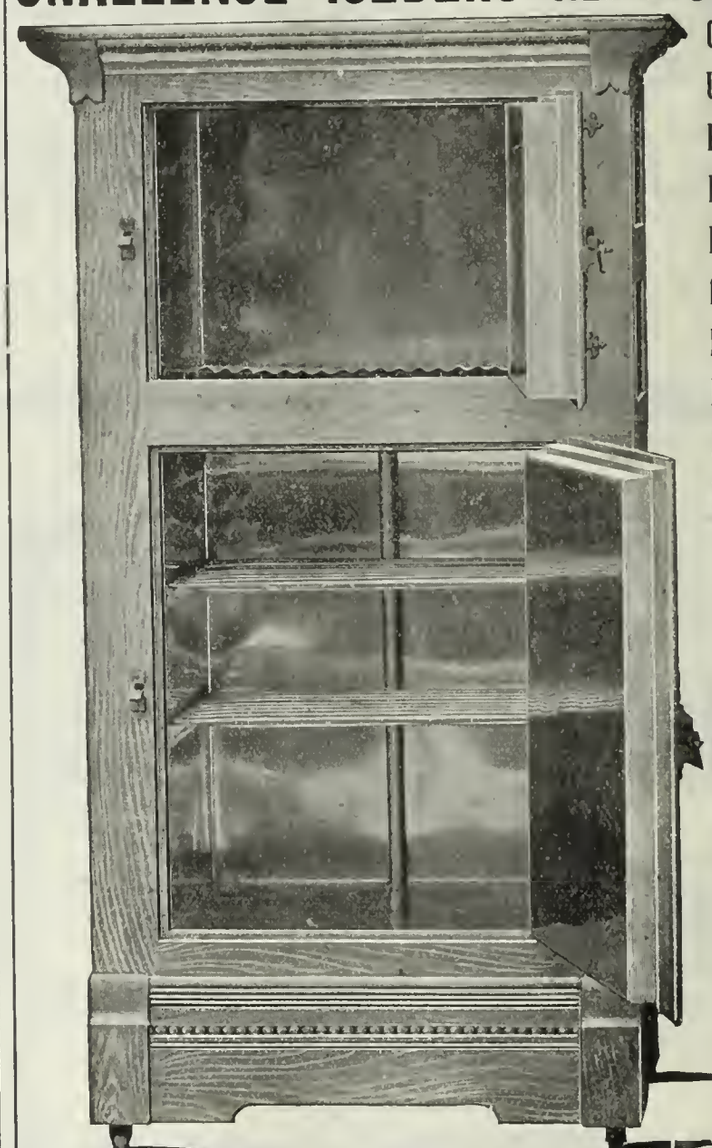
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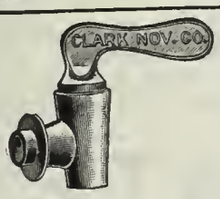
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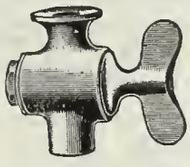
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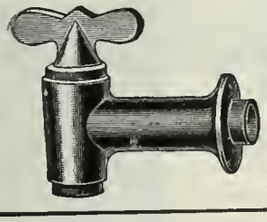


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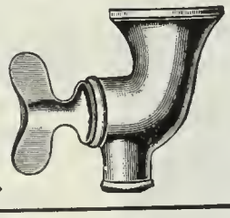


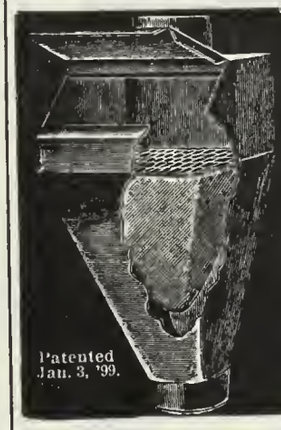
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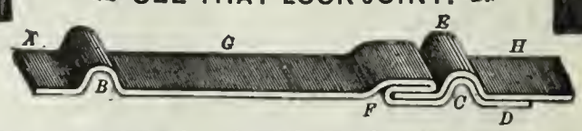
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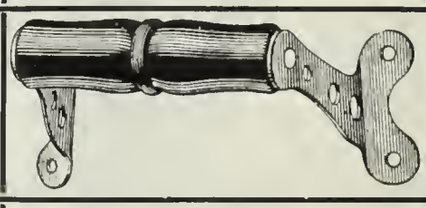
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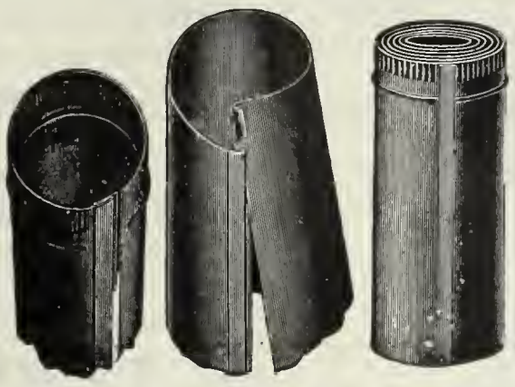
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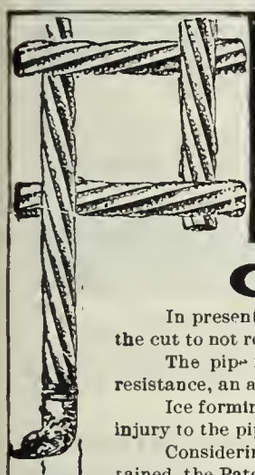
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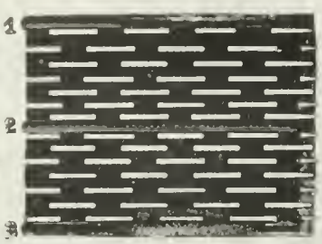
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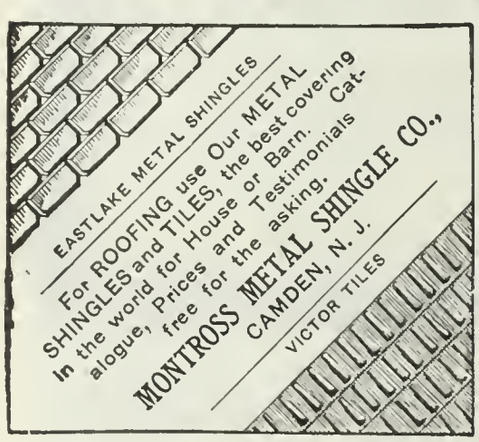


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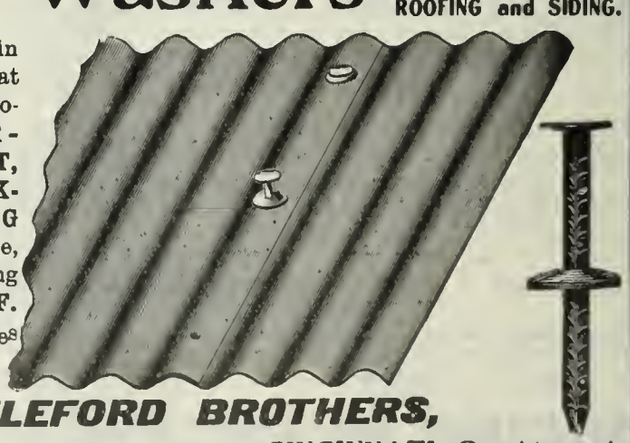
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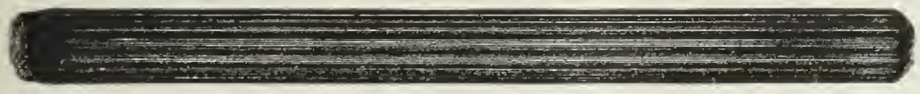
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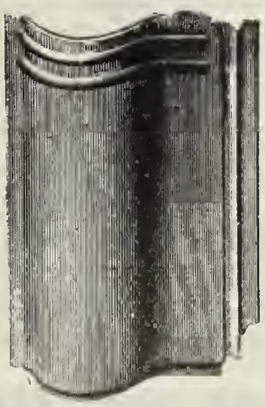
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Galvanizing and Tinning.

A Practical Treatise on Coating with Tin and Zinc, with a Special Chapter on Tinning Gray Iron Castings. By W. T. Flanders. Size 5½ x 8 inches. 93 pages, 40 illustrations. Cloth bound. Price $2.00.

The author of this work has made a specialty of galvanizing and tinning, and has been employed to erect plants in various parts of the country, also to instruct the owners, so that, in all instances, they have been able to operate them successfully. The subject of galvanizing is, therefore, treated from the standpoint of an expert and in a practical manner. The selection of materials and apparatus for erecting plants of large and small capacity is treated, together with instructions for their equipment and accompanied by many illustrations of the plants and of the tools and appliances. Plain directions are given for the preparatory treatment of metals and articles to be coated, and every detail which is of importance in successfully applying to metals a secure and attractive coating is described. The tinning of articles is treated in the same practical manner. The difficulties found by many who have attempted to tin malleable and gray iron castings are explained and methods for doing the work made simple.

CONTENTS.

Galvanizing.

Locating a Plant and Selecting a Kettle.
The Galvanizing Room.
Tanks for Acids and Other Purposes.
Tools for Galvanizing.
Filling and Firing a New Kettle.
The Use of a Pyrometer.
Materials Used in Galvanizing.
Building and Setting Kettles.
Removing Scale with Sulphuric Acid.
Cleaning Sandy Castings with Sulphuric Acid.
Preparing the Work for Dipping in the Zincing Bath.
Drying the Work.
The Heat of Zinc.
Dipping the Work in the Molten Metal.
The Formation of Dross in the Kettle.
Running Over, or "Sweating," Zinc Dross.

Tinning Malleable Iron, Wrought Iron and Steel.

Preparing the Work.
Tools and Kettles.
A Tinning Plant.
Plan of Tinning Plant.
Removing Scale and Rust with Sulphuric Acid.
Cleaning Sandy Castings by Sulphuric Acid.
Cleaning Sandy Castings with Hydrofluoric Acid.
Removing Paint or Grease.
Tinning with a Single Kettle of Tin.
Tinning with Two or More Kettles of Tin.
Passing the Work Through the Tinning Kettles.
Tinning Wire in Coils.
Tinning Steel Spoons and Similar Articles.
Retinning.
Setting Retinning Kettles.

TINNING COMMON GRAY IRON.

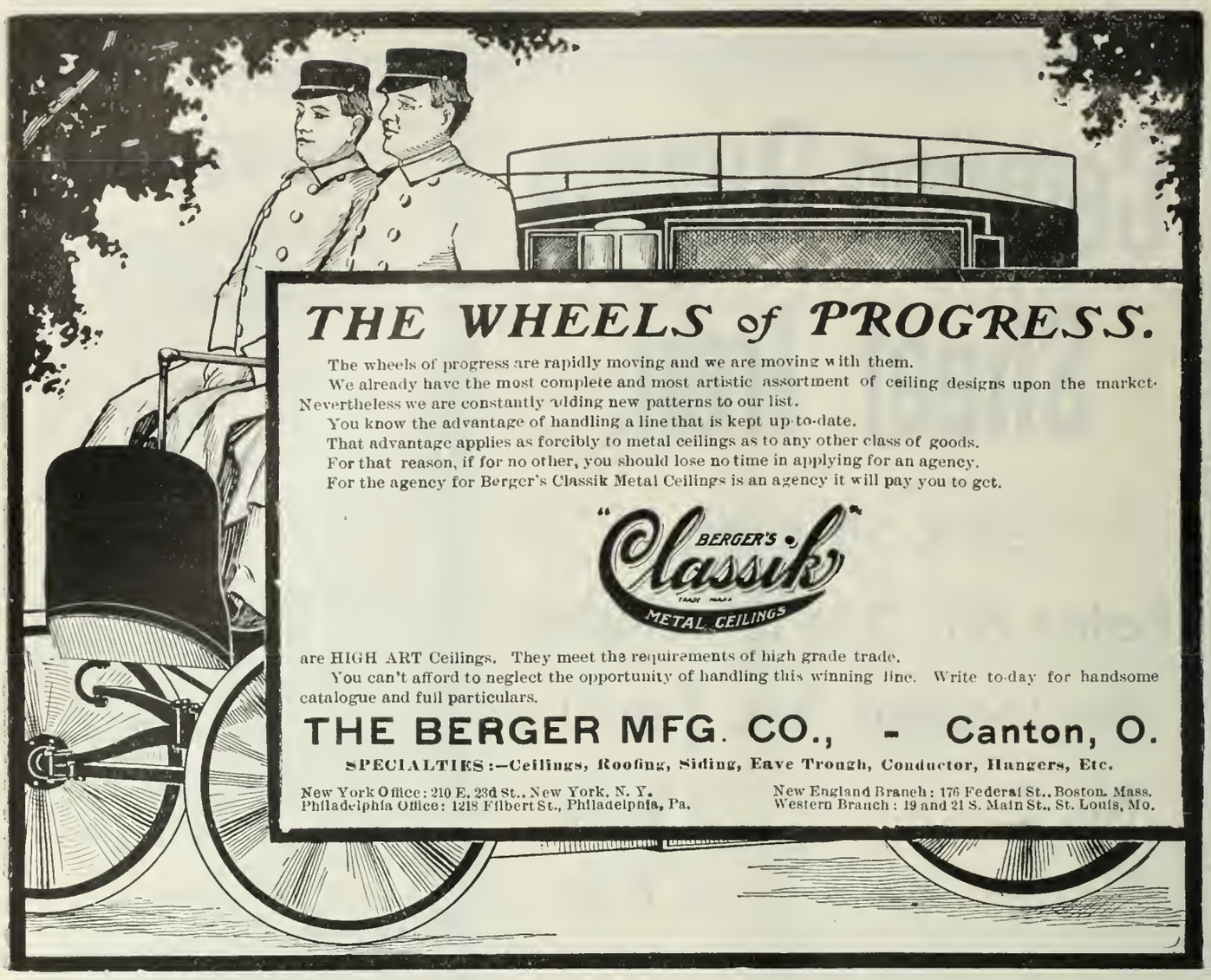
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General Considerations.
Tumbling Barrel.
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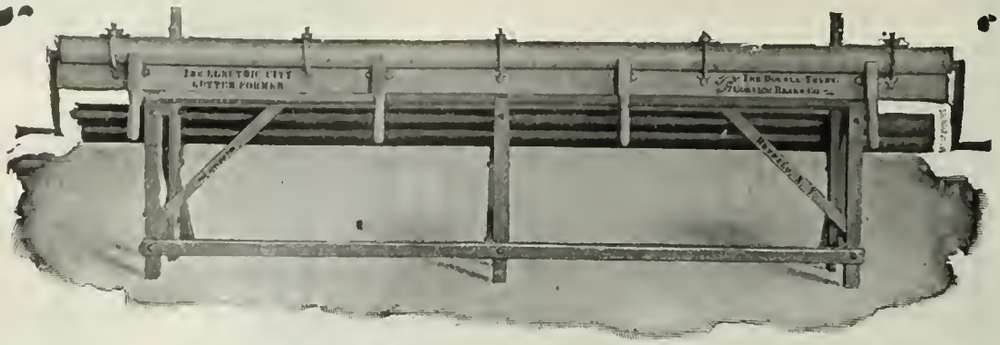
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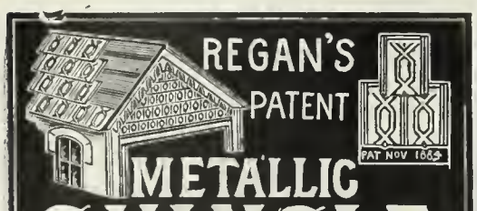
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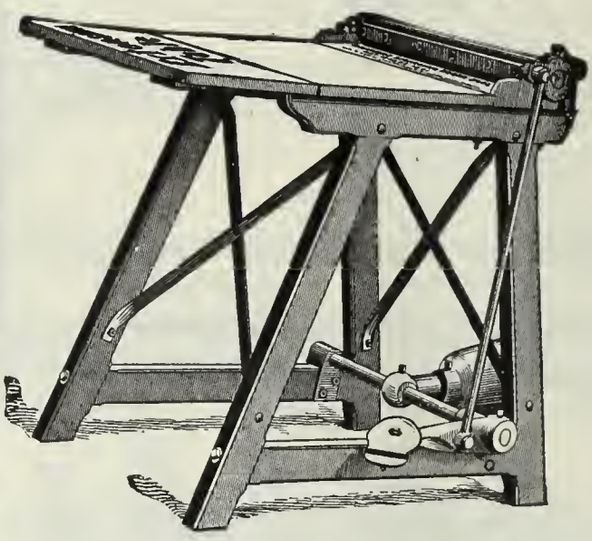
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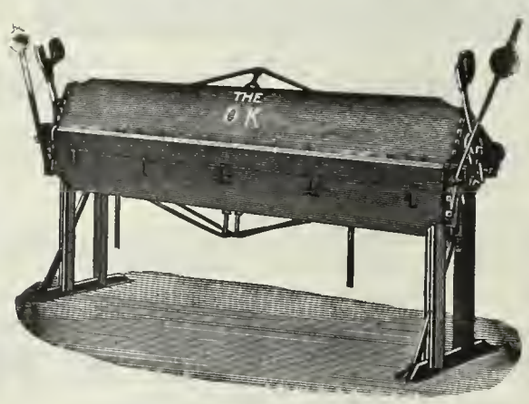
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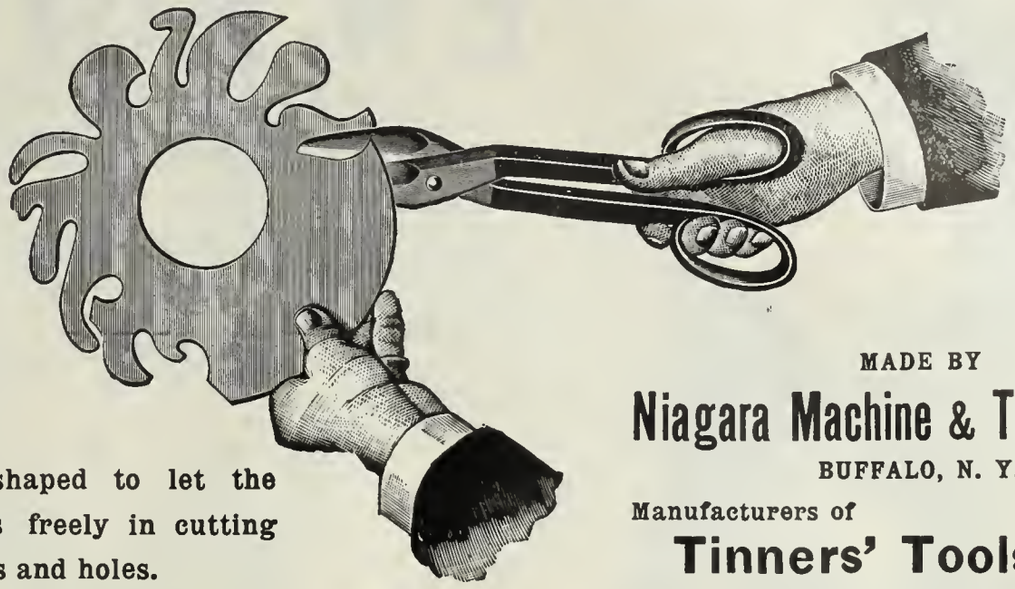
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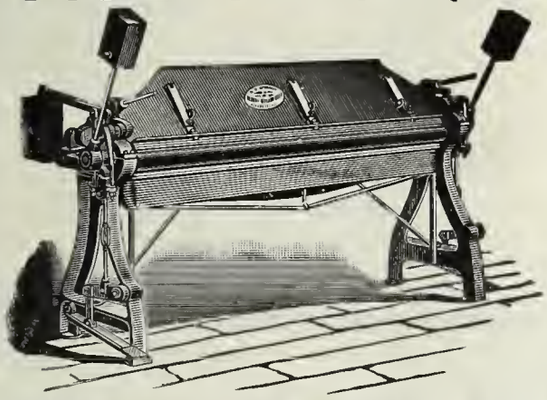
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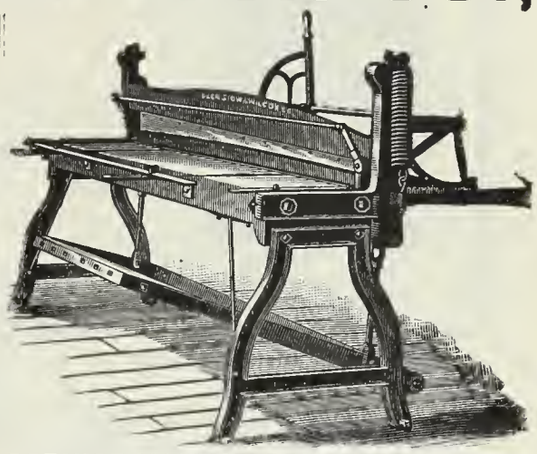
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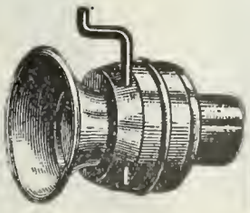
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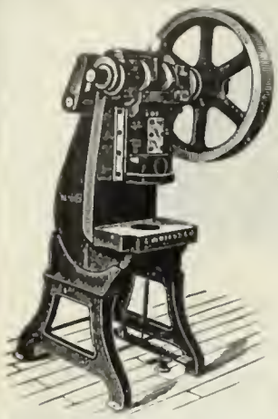
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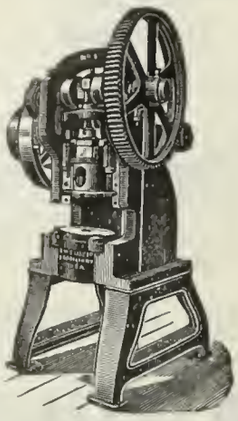
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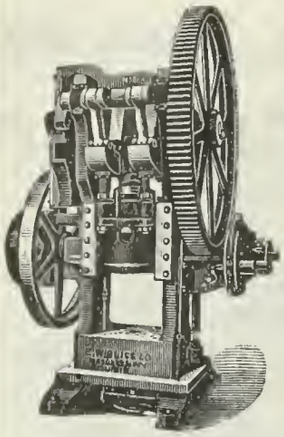
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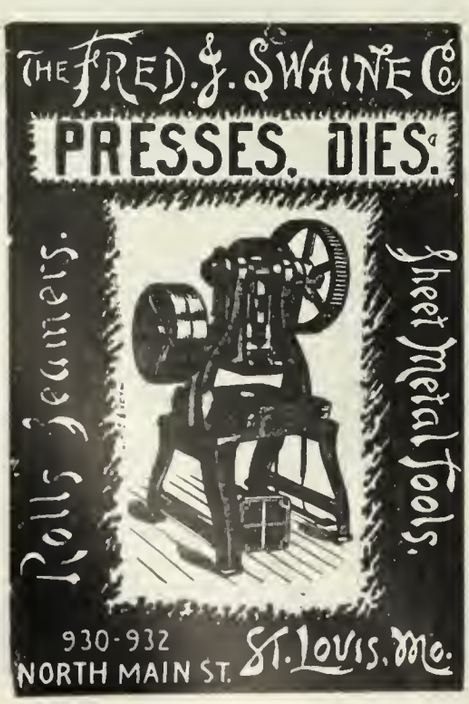
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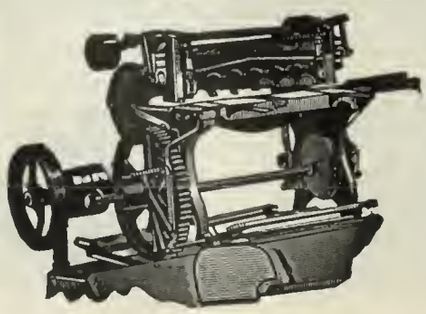
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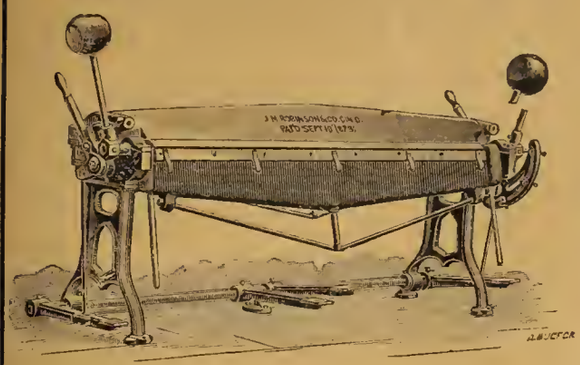
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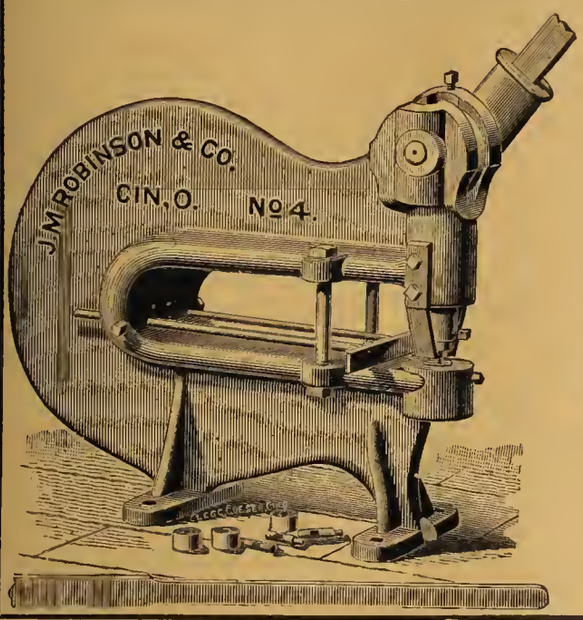
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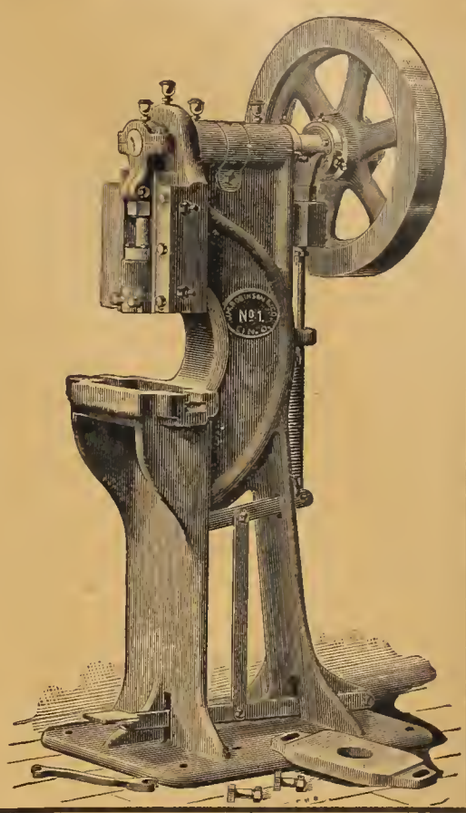
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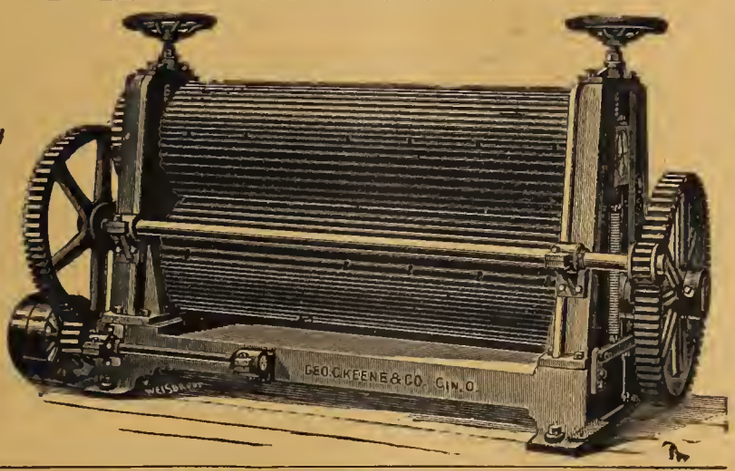
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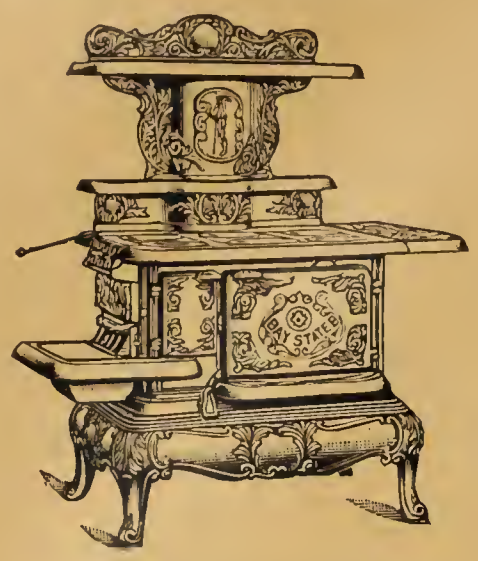
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Quality determines price. Bay State Quality never changes and is always worth the price. In mate ial it is the best ; in wo·kmanship the standard.

SAME IN 1836, SAME IN 1902

BARSTOW STOVE COMPANY,

BOSTON, 55 Portland St.
PROVIDENCE, R. I.
NEW YORK, Beekman and Water Sts.

Ninety-two years' experience is behind Taylor Old Style. It is the best roofing tin that can be made.

N. & G. TAYLOR CO.
Sole Manufacturers
PHILADELPHIA
Established 1810

Lighted by Frink Reflectors.

CARNEGIE LIBRARY,
PITTSBURGH.

I. P. FRINK, 551 Pearl St., New York.

L. & R. WISTER & CO.,

Bullitt Building, Philadelphia.

Dunbar Foundry Pig Iron.
Dunbar Connellsville Coke for Foundry Use.
American Sheet Iron Co.'s Sheet Iron.
American R. G., cleaned, of uniform black color.
Dealers in all kinds of Iron and Steel Scrap.

BRUCE & COOK

TINNERS'
TOOLS and MACHINES

TINNERS'
SUPPLIES

186, 188 & 190 Water Street, a
248 & 250 Pearl Street,
NEW YORK.



Ideal Sap Spou

Are made open or closed, and a full line of other Maple Sugar goods. Send for dealers' price list.

CHARLES MILLAR & SON CO , Utica, N.

HUB RANGES

H
U
B

If you want the best line ; the line with the **most attractive** and progressive selling features, look into the merits of the

Hub
Line of Ranges
Steam and Water Heaters;
Hot Air and Combination Furnaces.

SMITH & ANTHONY CO., Boston.

It Takes Sand

for a merchant in any line of business tomainta in a fair, uniform price when some competetor with cheap inferior goods is shouting bargain prices ; but its no secret that honest, reliable goods always win in the end and that's why so many successful stove merchants sell

GLENWOODS.

Weir Stove Company, Taunton, Mass.

SOLDER

Our Various Brands:
ADMIRAL,
FORT PITT,
FREEHOLD,

Are made from strictly New Metals and the Proportions Guaranteed.

McCLURE & CO.,

Manufacturers of Tin Plate,

PITTSBURGH, PA., 211, 213 and 215 Second Ave.
PHILADELPHIA, PA., 115 North 7th Street.

Index to Reading Matter. Page 54.

Index to Advertisements, Pages 56 - 58.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

LVII. ER 11. } NEW YORK AND CHICAGO, MARCH 15, 1902. { ONE DOLLAR A YEAR. SINGLE COPIES 5 CENTS.

WORTH MFG CO. TOOLS and SUPPLIES for STEAM WATER and GAS USERS BOSTON MASS

WALWORTH HEAVY PIPE VISE.



A first-class Tool for General Machine Work. Takes to 6-inch.

BOSTON, 128 Federal Street.
NEW YORK, Park Row Building.



The Gorton Side Feed Boilers

FOR STEAM AND HOT WATER HEATING.

INVESTIGATE FOR YOURSELF.

Send for Catalogue and Prices.

GORTON & LIDGERWOOD CO.,

96 Liberty St., NEW YORK. Old Colony Bldg., CHICAGO.
77 Oliver St., BOSTON. Prudential Bldg., ATLANTA, GA.



STOVE LININGS

McLEOD & HENRY CO.,

TROY, N. Y.

AMERICAN STEAM and ALTITUDE GAUGES, POP SAFETY VALVES.

Heating Specialties. American Steam Gauge & Valve Mfg. Co., Bismark St., Boston, Mass., U. S. A.

We like to sell single ranges and furnaces, but we like better yet to sell them in bunches of six, a dozen or a hundred. Not long ago, we sent six of our Excelsior Double Oven Ranges to Mr. J. W. Morrison of Holmesburg, Penna., and this is what he did with them:

"I placed six of the 806 Excelsior Portable Double Oven Ranges in the buildings known as the Annex to the Morelton Inn, at Torresdale, Penna. Every one of these ranges has given entire satisfaction."

That double oven Excelsior Range, by the way, seems to occupy a field of its own. It is uniquely good.

ISAAC A. SHEPPARD & CO.

NEW YORK PHILADELPHIA BALTIMORE

Apollo galvanized iron

soft, inelastic and

ugh. Do anything to

it makes no trouble.

Saves wages.

erican Sheet Steel Company, New York.

If you have a line of

P. P. STEWART'S STOVES

on your sample floor your trade is assured.

Quick sellers bring big profits.

FULLER & WARREN CO., Troy, N. Y.

This Ad. changes every week.

NOTICE.

Silver, Nickel Platers and Brass Goods Mfrs. MATERIAL FOR DRYING PURPOSES.

Write for prices to John Sommer's Son, 355-365 Central Ave., Newark, N. J.



CROSBY SPRING-SEAT

GLOBE and ANGLE VALVES, IRON and BRASS.

All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.

Crosby Steam Gage & Valve Co.,

BOSTON: 95 Oliver St. NEW YORK: 78 John St. CHICAGO: 21 23 W. Lake St.



FOLLANSBEE BROTHERS CO.,
328-330-332 Second Ave.,
Pittsburgh.
Galvanized and Black Sheets.

The Leaders:
Follansbee Pure Iron Old Style; made specially, having Charcoal Iron Base.
Also, Scott's Extra Coated, well known everywhere.
Samples on application.

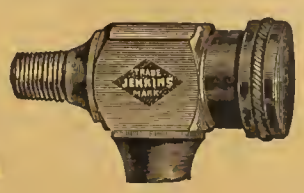
Philadelphia, 133 Arch St.
Chicago, 504 N. Water St.
Louisville, 7th and Magnolia.

team Specialties.

LIEF and NOISELESS BACK
EVATOR VALVES, PRESSURE VALVES,
EAM TRAPS, PUMP GOVERNORS,
EAM AND WATER STEAM and OIL SEP-
DUCING VALVES, ARATORS
NK TEMPERATURE CONTROLLER and
A No. 1 DAMPER REGULATORS

KIELEY AND MUELLER,
17 W. 13th St., - NEW YORK.

JENKINS IMPROVED AUTOMATIC AIR VALVES.



Suitable for high or low pressure. Take no more room than an ordinary air cock. Endorsed by the leading steam experts as the best made and the quickest working. All genuine stamped with our Trade Mark.

JENKINS BROS., New York, Boston, Chicago, Philadelphia.

READ OUR "AD"
Page 10.
MAGEE FURNACE CO.,
Boston.

ROUND OAK
STANDARD OF AMERICA

The Beckwith Hot Blast
will be a new member of the Round Oak Family for 1902.
We mean that this stove shall be the best "hot blast" on the market.
It will have the famous Round Oak one piece bottom and draft register, which never gets out of order—and is positively air-tight.
Movable hot blast draft tube in top with new device for raising or lowering that draft may always be delivered on top of fire.
The incomparable anticlinker Round Oak coal fixture will be used.
It will be mounted with Woods 14 gauge Double refined, cleaned and cold rolled iron, highest quality made.
Nickel work plain, massive and rich.
If you are looking for a "hot blast" to compete write us for further details. "Price right."



ESTATE OF
P. D. Beckwith
DOWAGIAC
MICHIGAN

Makers of Good Goods Only

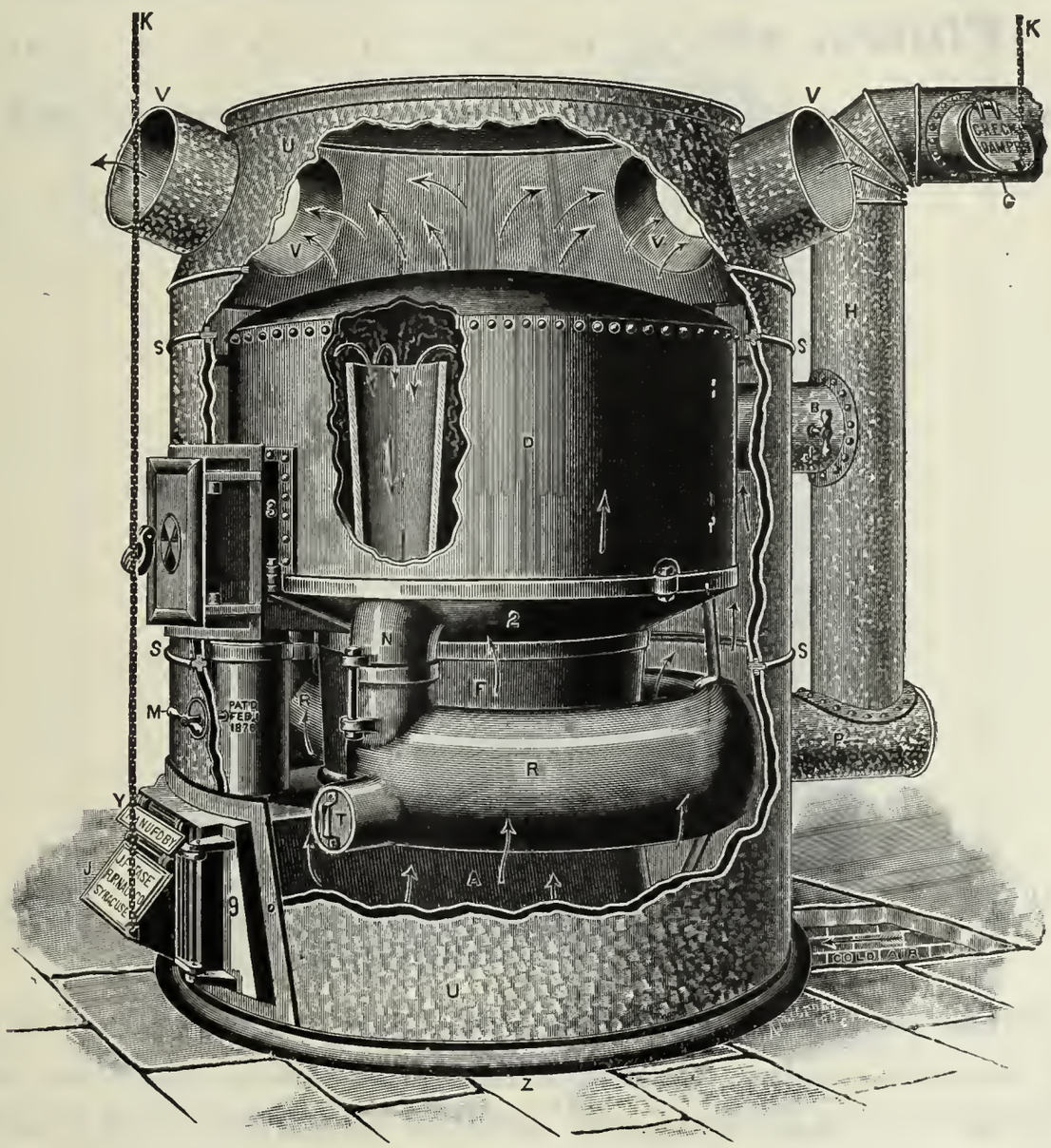
HB CHICAGO

Like a house builded upon the sand, so is a trade founded upon the sale of "Paste-Board" Heaters.

The dealer who sells "Economy" Furnaces builds upon the rock.

The PEASE-ECONOMY
WARM AIR FURNACE

Has proven the corner-stone of more than one steady lucrative business.



LOW DOWN PATTERN.

This is a Heavy, Durable Heater of the Highest Efficiency, but of Moderate Price. : : : :

INTERNATIONAL HEATER CO.,
UTICA, N. Y.

BOSTON, NEW YORK, CHICAGO, DENVER.

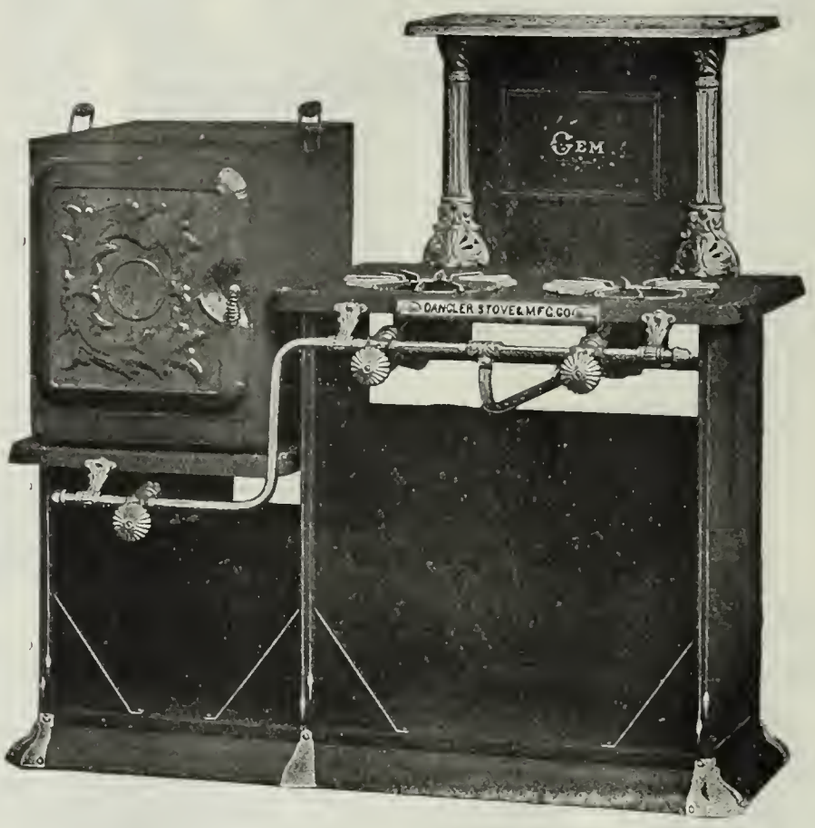
LARGEST MAKERS OF HEATERS IN THE WORLD.

THE DANGLER

For 1902 will put on the market a line of

Gasoline Vapor and Evaporating Stoves, Blue Flame Wick and Wickless Oil Stoves and also a line of Gas Ranges, Stoves, Hot Plates, etc. . . . . .

That for design, style and mechanical construction will not be equalled by any other make.



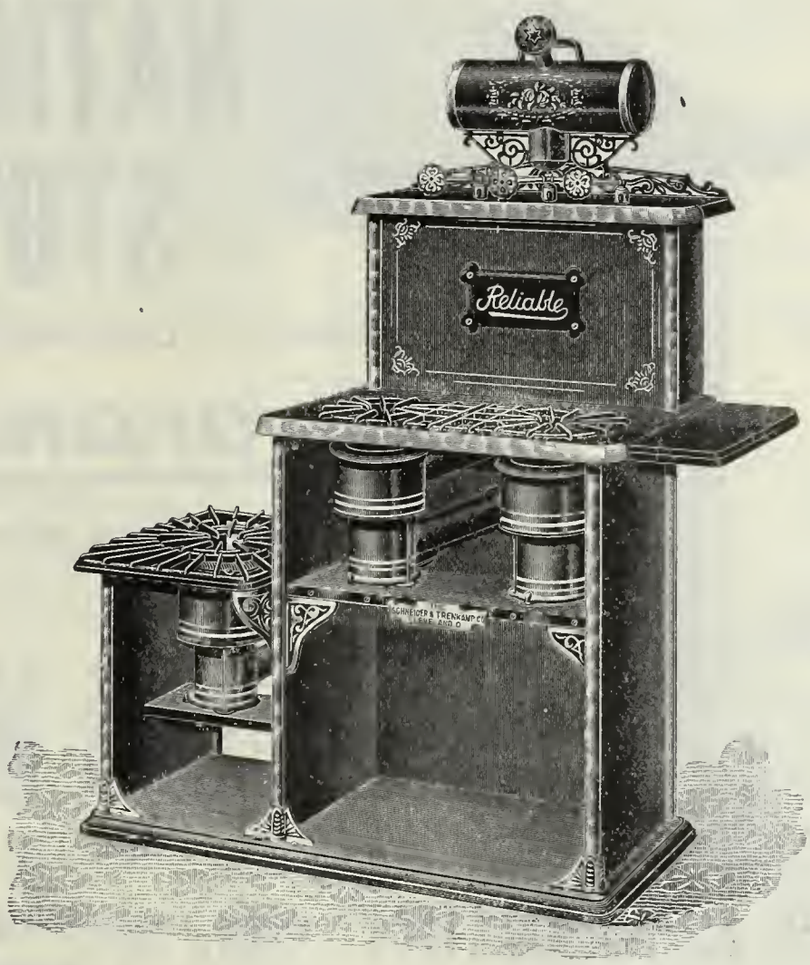
Our experience of 21 years in the manufacture of this line of goods,—being the oldest manufacturers,—justifies us in making the claim that our product has merits not found in other makes of Stoves in this line, notwithstanding that our lists, discounts and terms are the same as other manufacturers'.

All orders intrusted to us will have our careful and prompt attention. For further information we invite correspondence.

The Dangler Stove & Mfg. Co.,
Cleveland, Ohio, U. S. A.

Reliable Vapor Stoves and Ranges for 1902.

DEALERS who are seeking a strictly high grade line of Vapor Stoves and Ranges that are standard the country over cannot afford to overlook our line. "RELIABLE" Stoves have the NAME and FAME as being the best and most successful to handle.



THERE are NONE better. A few are claimed as good. None as well and favorably known. Our reputation will not permit of our making any inferior goods. If you wish to control the Vapor Stove business of your city, secure the agency of the "RELIABLE." They have proved profitable and satisfactory to thousands in the past, and will to you

Our line for 1902 is larger and finer than ever. Send for our latest catalogue. It is yours for the asking.

MADE BY

The Schneider & Trenkamp Company,

CLEVELAND. CHICAGO. SAN FRANCISCO.



OUR

CATALOGUE,

SHOWING

GAS RANGES
CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS

WILL BE FURNISHED FOR THE ASKING BY

Enterprise Stove Co., VINCENNES, IND.



NATIONAL STOVES

THE ONLY SAFE GASOLINE STOVE MADE.

LORAIN, OHIO, CHICAGO, 104 Lake St.

"Insurance"

SALES AGENTS.

EUGENE MUNSELL & CO., - New York
F. M. BORDEN & BRO., - - Philadelphia
PRESCOTT & CO., - - - Boston, Mass.
BUTLER & JOHNSON, - Syracuse, N. Y.
PACIFIC STOVE CO., - - Los Angeles, Cal.
A. C. BARLER MFG. CO., - Chicago, Ill.

HARPER & McINTIRE CO. For IOWA, NEBRASKA. KANSAS, MISSOURI.

OTTUMWA, IOWA.

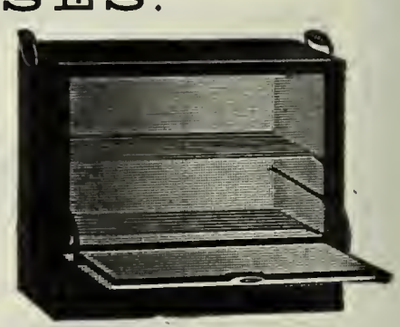
ACME LINE, 1902.

Asbestos Lined Ranges and Ovens, Cookers and Hot Plates.

FOR ALL GASES.



Catalog No. 35 on application.



H. ADLER CO.,

PITTSBURG, PA.

HENRY WATERMAN, - - 195 Lewis St., N. Y., Eastern Agent.



Cinderella
Steel Ranges

REPRESENT

The Best Materials,
The Best Construction,
The Best Workmanship.

THEY ARE

The American Standard for Excellence.

ALL STYLES AND SIZES AT MODERATE PRICES.

We would be pleased to send our catalogue.

STOVES AND RANGES CINDERELLA NEVER FAIL

PITTSBURGH STOVE & RANGE CO.,

PITTSBURGH, PA.

WESTERN SALES AGENT,
W. D. Sager, 38 and 40 Michigan St., Chicago, Ill.

STOVES AND RANGES CINDERELLA NEVER FAIL

WROUGHT STEEL

RANGES

LIKE THE

"PACIFIC"

Are best because they're made stronger, better, more perfect than any other similar construction. You should write for prices and secure our Catalogue.

It is made with High Closet, Rolling Front, Six Holes, for Hard or Soft Coal; is the latest, best and handsomest Steel Range ever offered, one that you can offer as simply "out of sight" compared with that sold by the peddlers. Try it.



...THE...

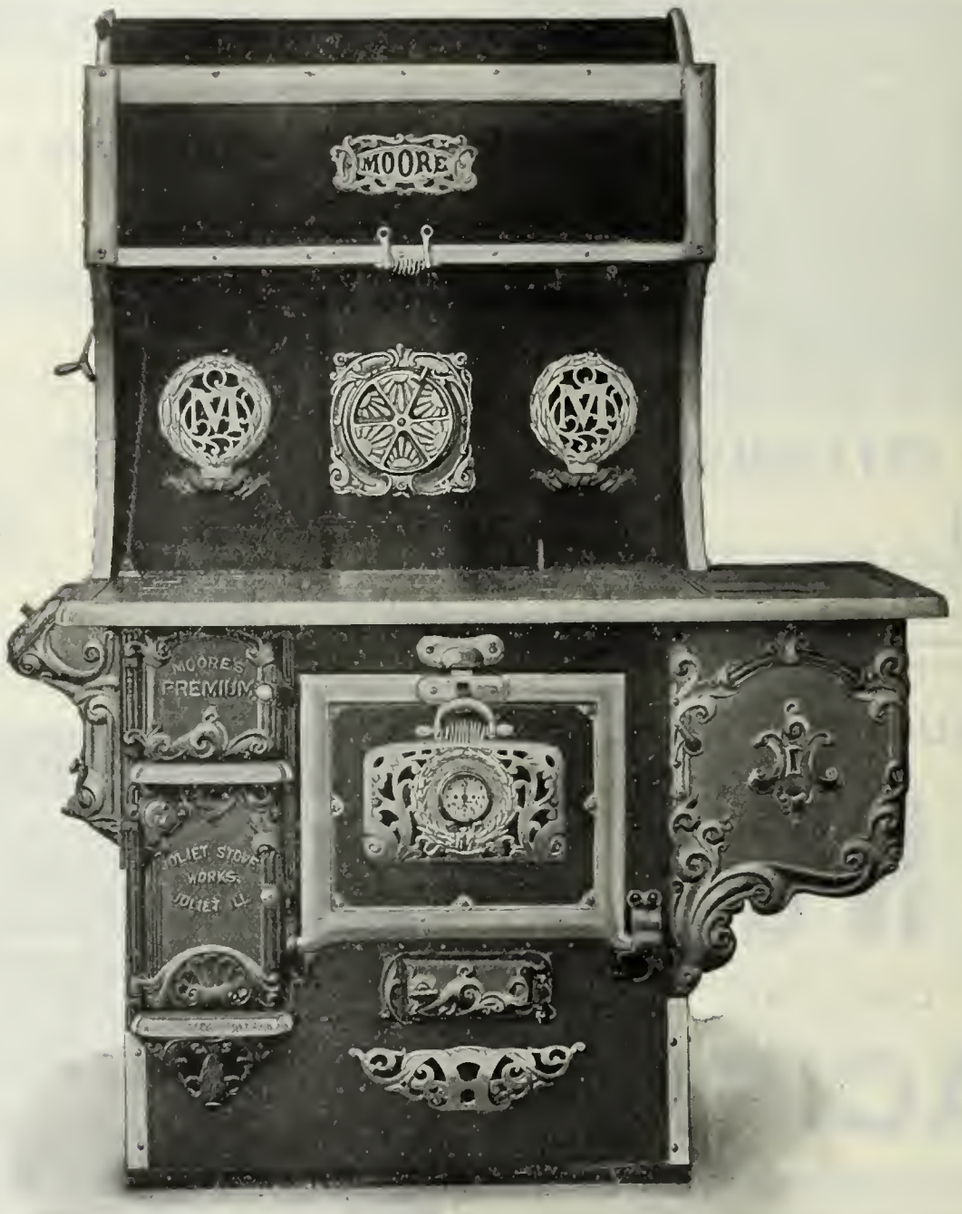
JOHN VAN RANGE CO.,

Warerooms:—419 ELM ST.,

Factories:—6-8-10 and 12 HOME ST.,

CINCINNATI, O.

Moore's Premium



There is a STYLISH ATTRACTIVENESS about

MOORE'S RANGES

Which, added to their well-known record for doing good work and durability, makes them easily

"The Easy Line to Sell"

JOLIET STOVE WORKS, Joliet, Illinois.

37

THE H.B.SMITH CO.,

WESTFIELD, MASS., U.S.A.

Catalogue furnished only upon application to

Heating Contractors, Engineers and Architects

92 Pages. Size 9 x 12 Inches.

COTTAGE BOILERS.

STEAM BOILERS (8 SIZES), 550 SQ. FT. RADIATION SUPPLIED.
WATER BOILERS (8 SIZES), 900 SQ. FT. RADIATION SUPPLIED.

PACIFIC COAST AGENTS

HOLBROOK, MERRILL & STETSON,

SAN FRANCISCO, CAL.

EUROPEAN AGENTS

AUG. EGGERS,

BREMEN AND NEW YORK CITY.

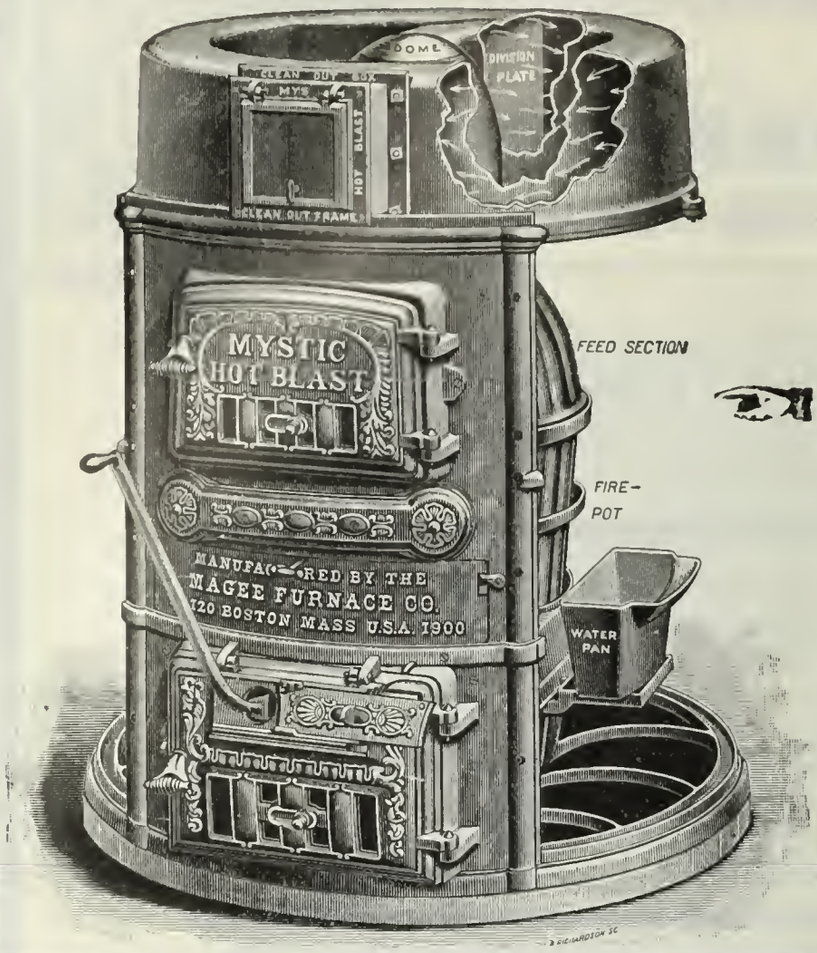
SALESROOMS:

THE H.B.SMITH CO.,

133 CENTRE STREET, NEW YORK.

510 ARCH STREET, PHILADELPHIA.

MAGEE MYSTIC HOT-BLAST FURNACE



Where's the Man or Woman who has never heard of

Magee HEATERS ?

Cut shows one of our *ALL CAST HEATERS* for warm air They're made to last. Gas and Dust Tight. Fire Pot, heavy and durable, connected by cup-joints in the center. Dock-Ash Revolving Grate. Durable in construction and heat-resisting qualities. Thorough combustion of the coal is positive.

Send for Furnace Catalogue.

MAGEE FURNACE CO.,

32-38 Union St., Boston.

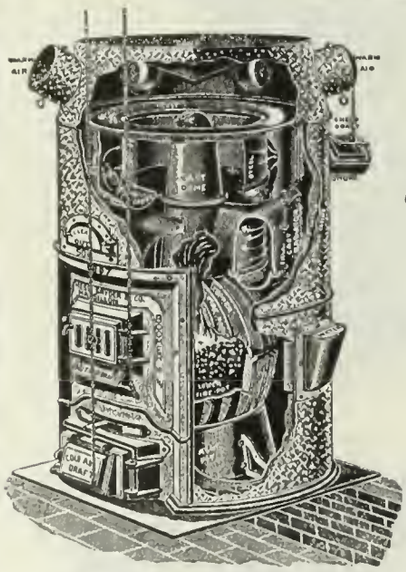
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REGARDING

Boomer Furnaces.

OR

Boomer Steel Ranges



Boomer Furnace.

We want to state in strongest terms possible that if you want the

HEAVIEST,
MOST DURABLE,
MOST ECONOMICAL

and easiest to take care of Furnace or Steel Range, buy a **BOOMER.**



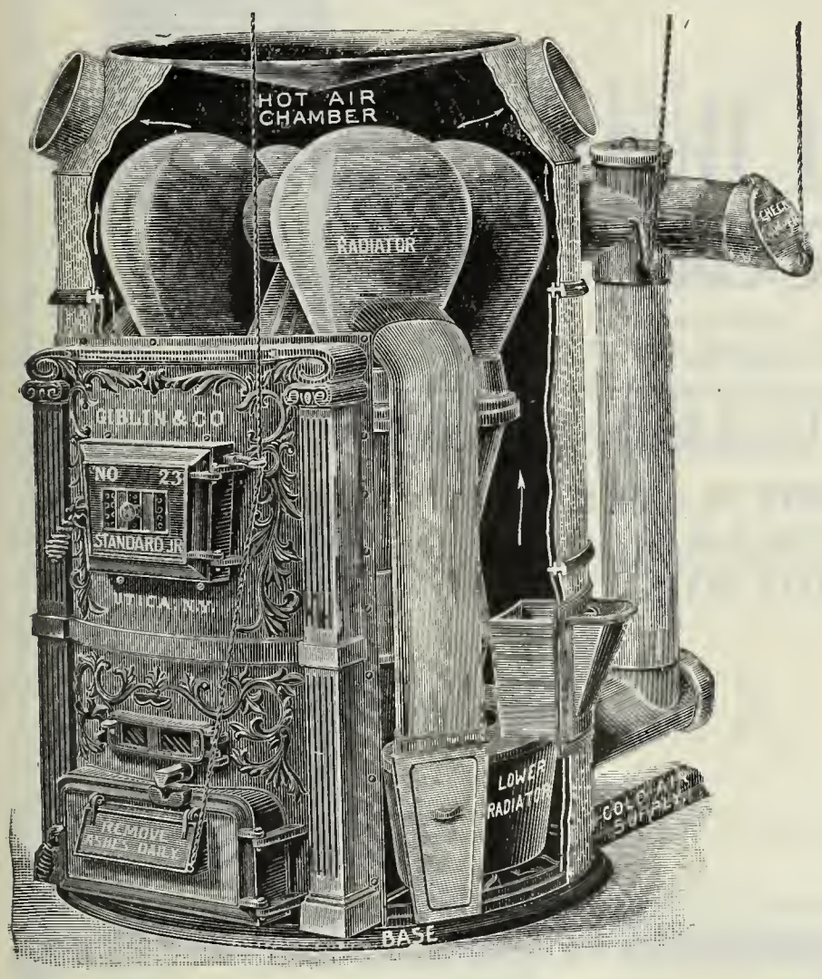
Boomer Steel Range.

Neither time nor money is spared to make them the Best.
Buy Boomers and save your coal bills.
We invite investigation.

THE HESS-SNYDER CO.,

Manufacturers, MASSILLON, O.

TOUCH A MAN'S POCKET



and you touch a sensitive spot. If your customer asks for a furnace and you furnish him with the cheapest furnace obtainable, it surely is not the best and he will judge all other furnaces by what he gets. He will, by using the cheapest furnace, burn more coal than he should; will burn it imperfectly.

IT WILL

cause more work, need frequent repairs, make him thoroughly dissatisfied. Such are the results of a direct draft furnace. We present the furnaces illustrated herewith to

SHOW

what indirect draft furnaces can accomplish. Nobody now uses a direct draft heating stove, because of the waste of fuel and the impossibility of regulating it.

These Furnaces

are in furnaces what base burners are in stoves and

Secure

for the user the benefit

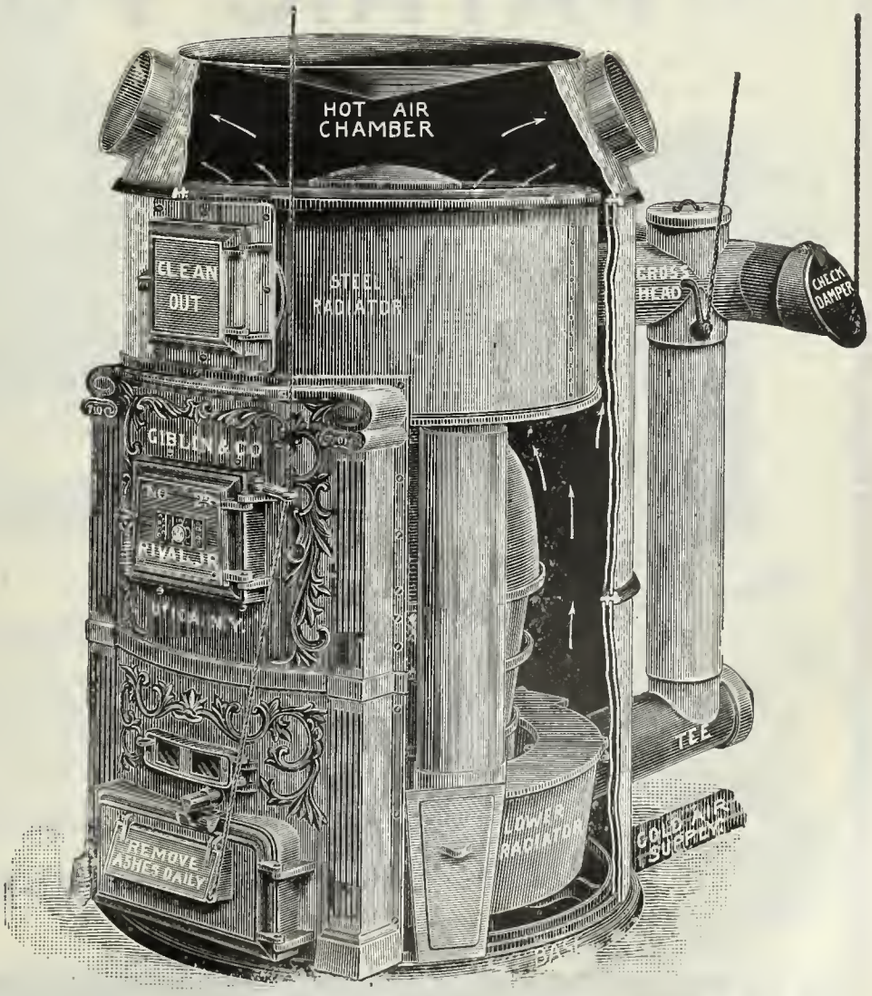
of **Heat** without

wasting fuel. They are operated with a steady, low fire, providing an even, continuous temperature

In Every Room.

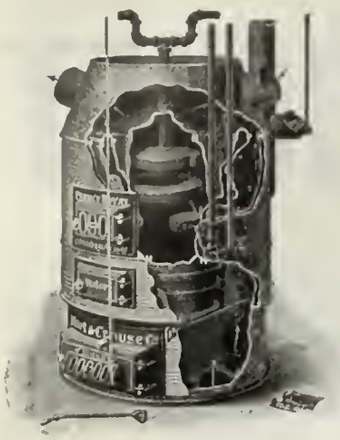
Whichever dealer secures the agency of these furnaces is sure to get the bulk of the business; and because he is selling something different from all other dealers will make sales at a good profit and make every one sold an advertisement for his business.

Dealers who have sold other furnaces and have found no profit in the business should investigate the merits of these furnaces and secure the agency and exclusive territory.



OUR CATALOG FULLY EXPLAINS.

GIBLIN & CO.,
UTICA, N. Y.





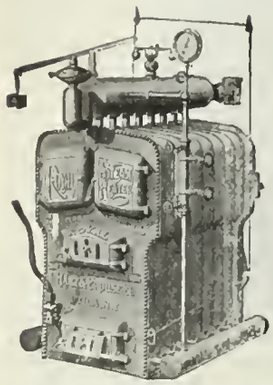
Royal Heaters.

HART & CROUSE CO.,

235 Water St., New York. 78 Lafayette St., UTICA, N. Y. 79 Lake St., Chicago

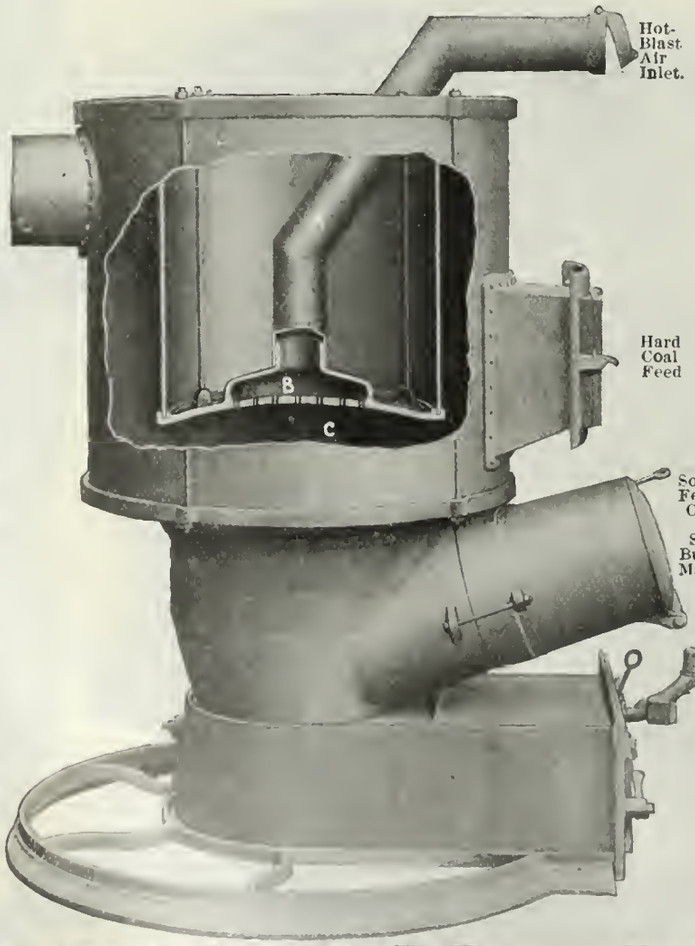
The Leading Line of Heating Apparatus.

HOT WATER,
STEAM,
HOT AIR.





THE PATRIC FURNACE.



Accompanying Cut Illustrates

OUR LATEST MODEL

"THE HUSTLER"

(With casing and front removed), embracing some

NOVEL AND EXCLUSIVE FEATURES.

SUCH AS THE

Coking and Smoke-Burning Magazine

in connection with fire-pot. A scientific device for the economical burning of soft coal. Cokes the coal in the magazine. Volatile parts of the smoke and gases are drawn over the hottest part of the fire in main fire-pot and largely consumed. This feature has proven a decided success for 17 years.

NOTICE OUR HOT BLAST.

We have a first-class form of this popular device to aid combustion. It has no parts in the fire to clog or burn off. It does the work. The Patric Furnace in its several styles has been

A Great Success for 28 Years.

It will burn successfully any kind of Coal, Coke or Wood.
It gives satisfaction to the user and to the dealer.
It has good talking points.
It is made of good materials.
It is an easy and ready seller.

SEND FOR CATALOGUE EXPLAINING FURNACE IN DETAIL.

THE PATRIC FURNACE CO.,

SPRINGFIELD, OHIO.

Furnace and Kettle

FOR

BUTCHERS' USE.

UNEXCELLED.



MADE IN SEVEN SIZES.

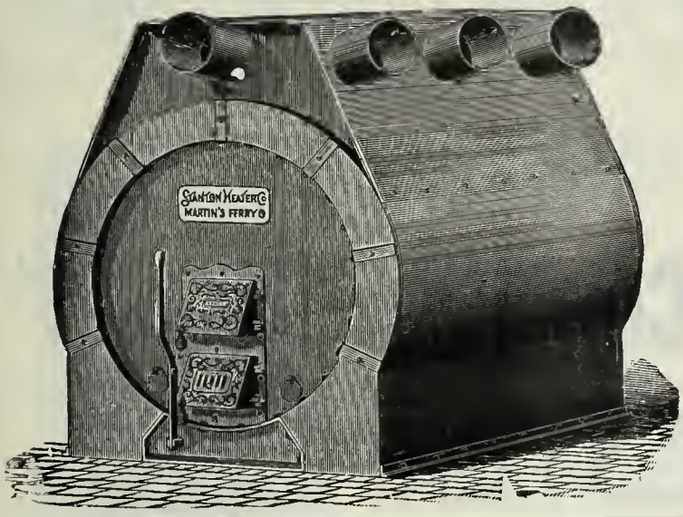
Furnace: Modern construction so that drafts are applied directly against the kettle, securing the greatest results from the least amount of fuel.

INTERIOR OF KETTLE PERFECTLY SMOOTH and CIRCULAR.

GIBLIN & CO., Utica, N. Y.

Prices and Discounts Quoted on Application.

The Stanton Seamless Heater,



PORTABLE CASED.

The cut herewith represents the ***Stanton Seamless Heater complete,*** with portable casing. The inside Casing Sheet is made of ***No. 24 cold rolled sheet steel.*** The outside casing is made of ***No. 24 Aluminum-coated sheet steel,*** which is anti-rust and will stand a much higher degree of heat than it will ever be subjected to before tarnishing. Heavy asbestos paper is placed between inside and outside casing, which prevents heat from radiating into cellar. ***This coating will not peel off,*** but remain pretty and white.

SEND FOR CATALOGUE.

THE STANTON HEATER CO.,

Martin's Ferry, Ohio.

See Our Advertisement Next Week.



IF YOU ARE NOT SELLING THE

Peck-Williamson Underfeed Furnace

you have not the trade and are not making the money you might Just a pull or two of the lever feeds the new coal from underneath.

The Underfeed Furnace consumes less fuel than any other furnace ever built. The coal is burnt more slowly. All the heat units from it, as well as from the smoke, are utilized and all smoke eliminated.

Our handsome booklet explains its splendid heating qualities and coal saving.

You may have this booklet and our special plans for selling. Ask for booklet about our Laundry Dryer also.

THE PECK-WILLIAMSON COMPANY,

CINCINNATI, OHIO.



"I used from eight to nine tons of coal, (usually nine) in my old ———Furnace. I have never used quite eight tons in any season since your "DIGHTON" was installed in '98 and I get much better results than I ever had with the old one."

A sample of many letters from "DIGHTON" customers who think the "DIGHTON" the most economical Furnace ever built.

DIGHTON FURNACE CO., Taunton, Mass.

FIFTY-TWO YEARS

LONG while, isn't it? A man ought to learn something in that time, hadn't he? Well, we don't know it all but we do know how to make Furnaces. Our apparatus, owing to its tubular construction, carries away the heat as fast as made, not allowing the air to become burnt or overheated. From a sanitary point of view it has no rival. We embody in our goods only the best materials and workmanship. Say! Mr. Dealer, there's a good profit in it, too.

WRITE FOR CATALOGUE.

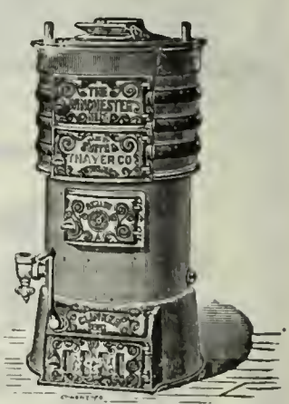
The Thatcher Furnace Co., WARM AIR FURNACES, RANGES, STEAM AND HOT WATER HEATERS. 240 Water St., New York.



WINCHESTER

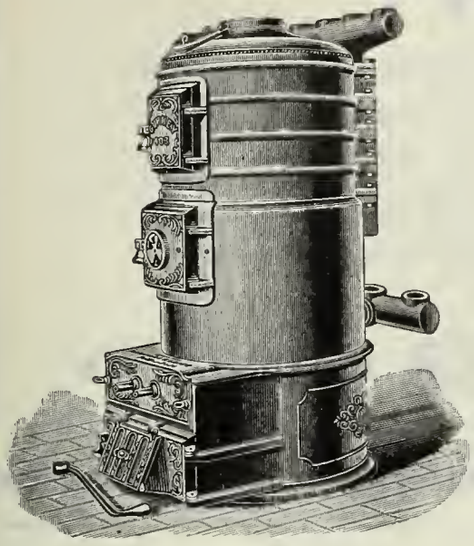
Price and quality are two good salesmen. Price gets his trade from the thoughtless, hasty, hurried man, who can't or won't look beyond the surface. Quality appeals to a man's intellect, his judgment, his mature thought. To such we offer the "WINCHESTER" heater, content to let its sale rest on its merit. Smith & Thayer Company, Boston, Mass. 106 Beekman St., New York.

HEATER.



BRAND STOVE CO. STOVES, RANGES and FURNACES. SEND FOR CATALOG. MILWAUKEE, WIS.

Both quality and price argue all the time in behalf of



"GURNEY" HEATERS.

Hot Water or Steam.

They are constructed along the most approved lines, have well proportioned grate areas, made of the best quality of iron by skilled workmen, and will be found thoroughly reliable in operation.

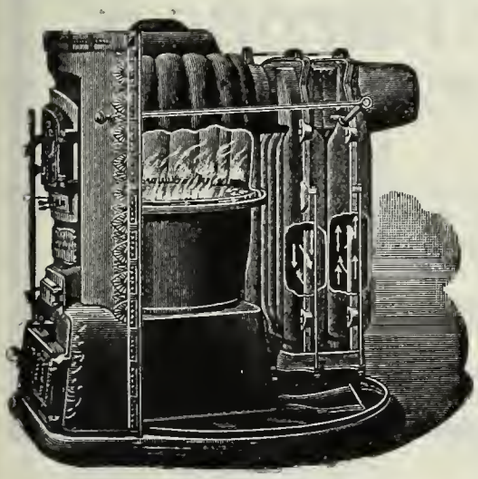
Capacities fully guaranteed.

Send for latest trade catalogue.

GURNEY HEATER MFG. CO.,

74 Franklin St., Boston. **111 Fifth Ave., New York City.**

Western Selling Agents, James B. Clow & Sons, 222-224 Lake St., Chicago, Ill.



Bengal Furnaces

ARE TRADE WINNERS.

Most powerful and compact furnace ever produced.—Over 3500 square inches radiating surface.—More than any other furnace their size.

ALL CAST IRON.

YOU NEED THEM IN YOUR BUSINESS.

Secure a BENGAL AGENCY at once.

WRITE US FOR CATALOGUE AND PARTICULARS.

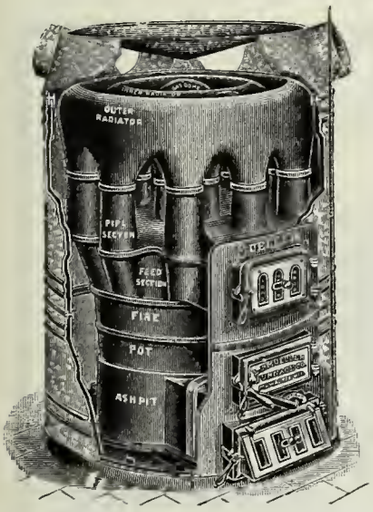
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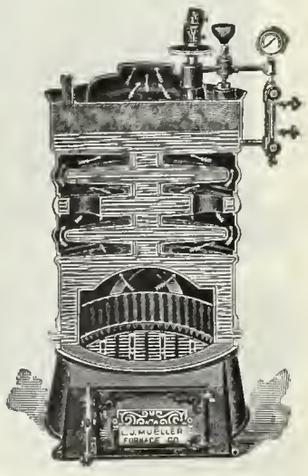
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look any further if in search of boilers for steam heat or hot water. The list opposite contains the standards. Send for catalog and get acquainted with them.

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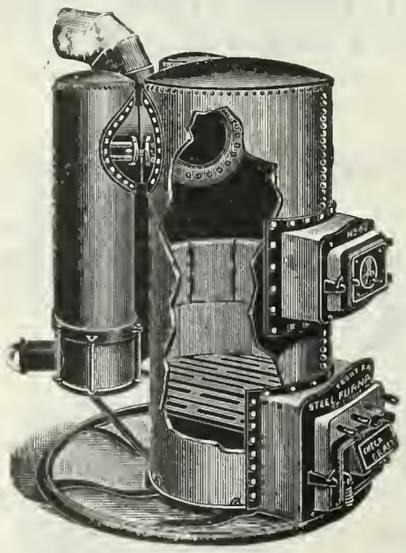
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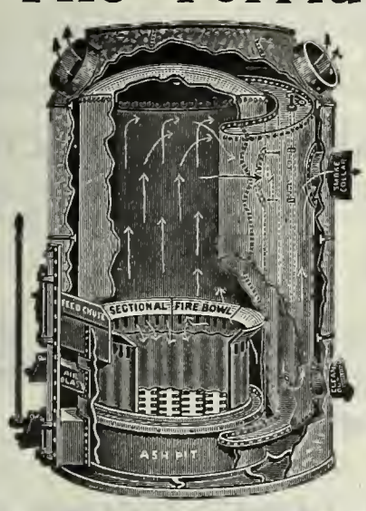
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HEATING BY COMBINATION STOVES AND FURNACES.

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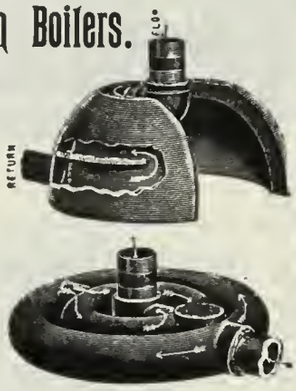
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They Fit Any Furnace.

Base section when used without ring sections.

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FOR STEAM OR HOT WATER.



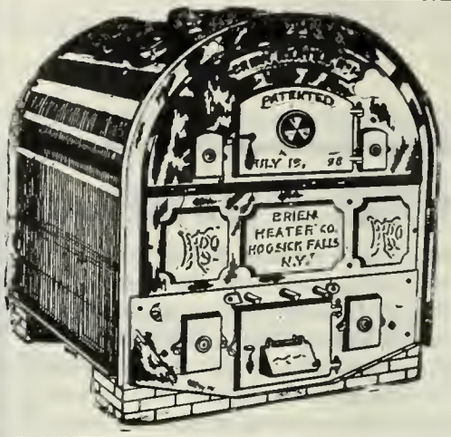
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OUR LATEST PRODUCTION.
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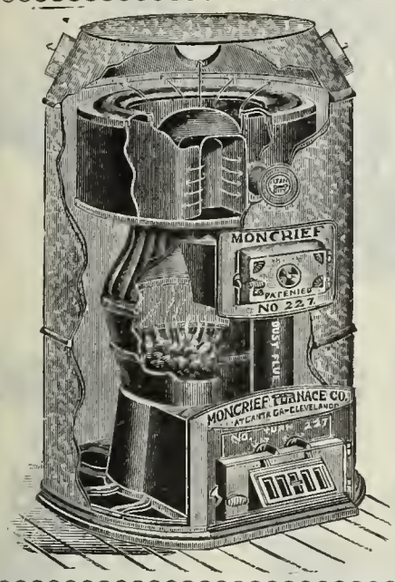
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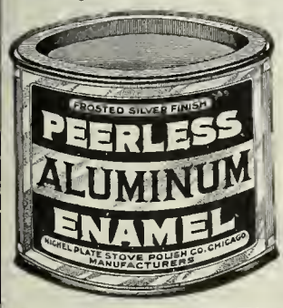
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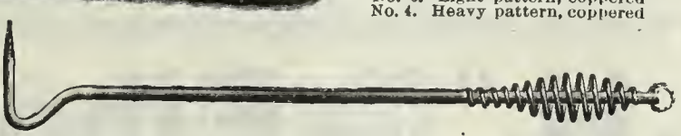
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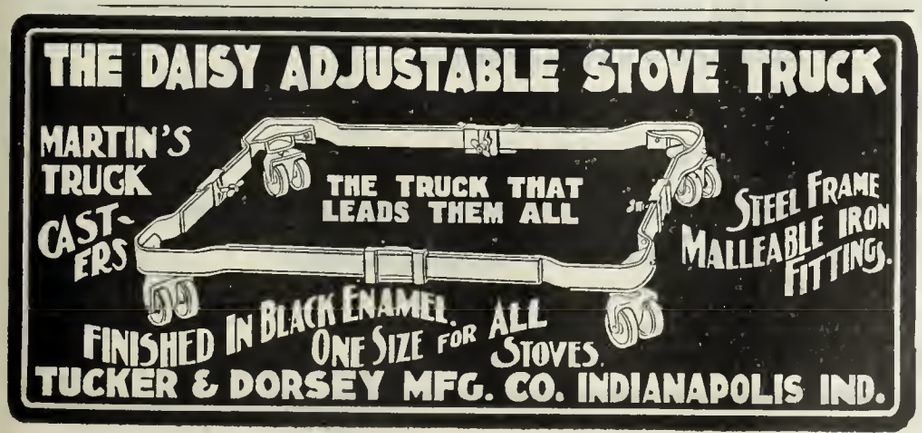
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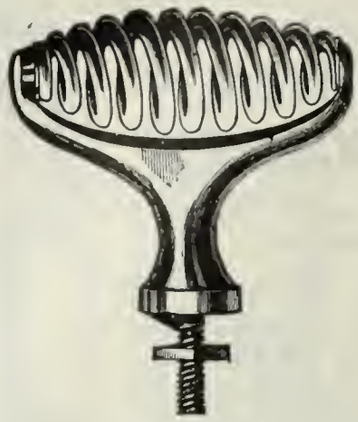
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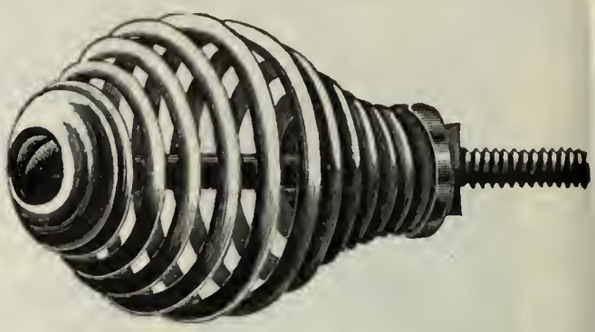
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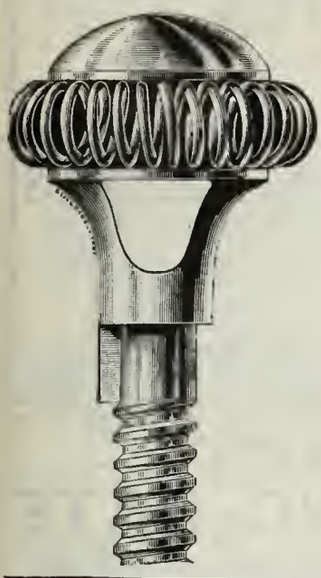
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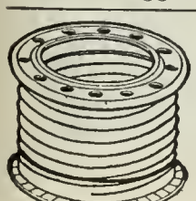
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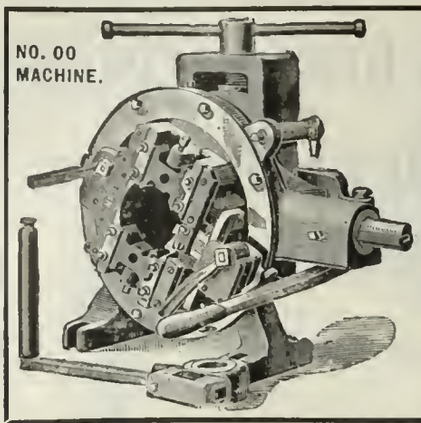


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NO DUST OR CHIPS
Can interfere with the work of

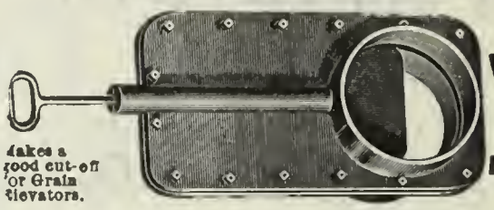
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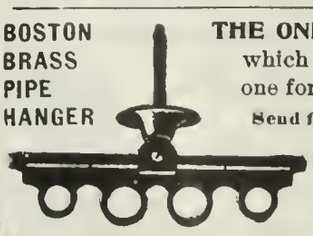
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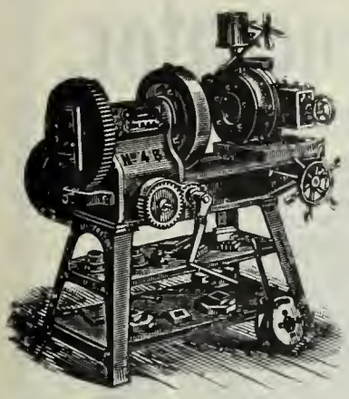
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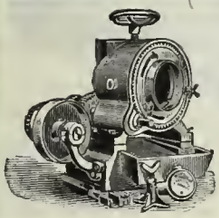
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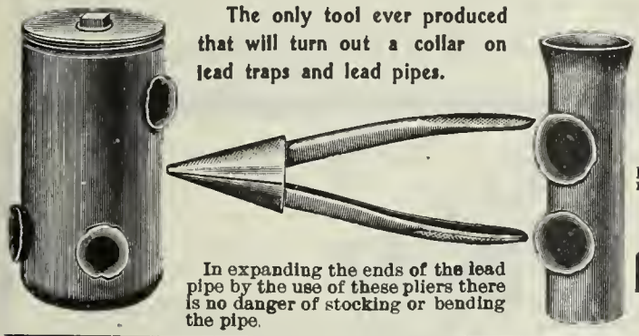
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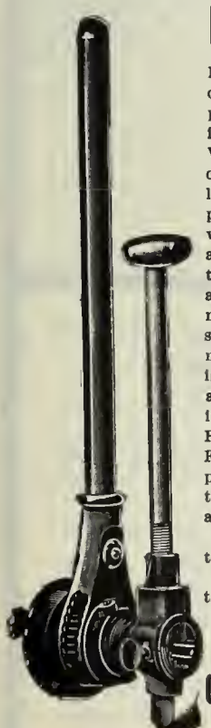
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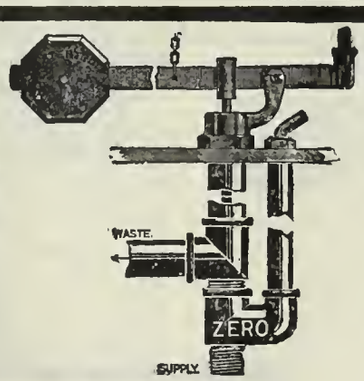
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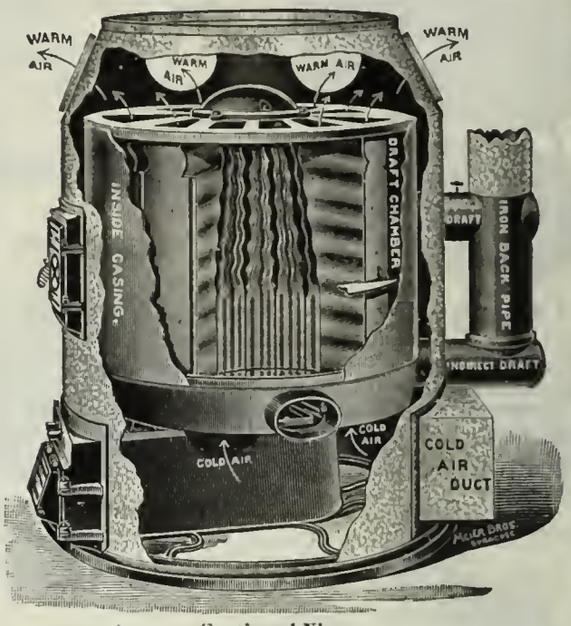
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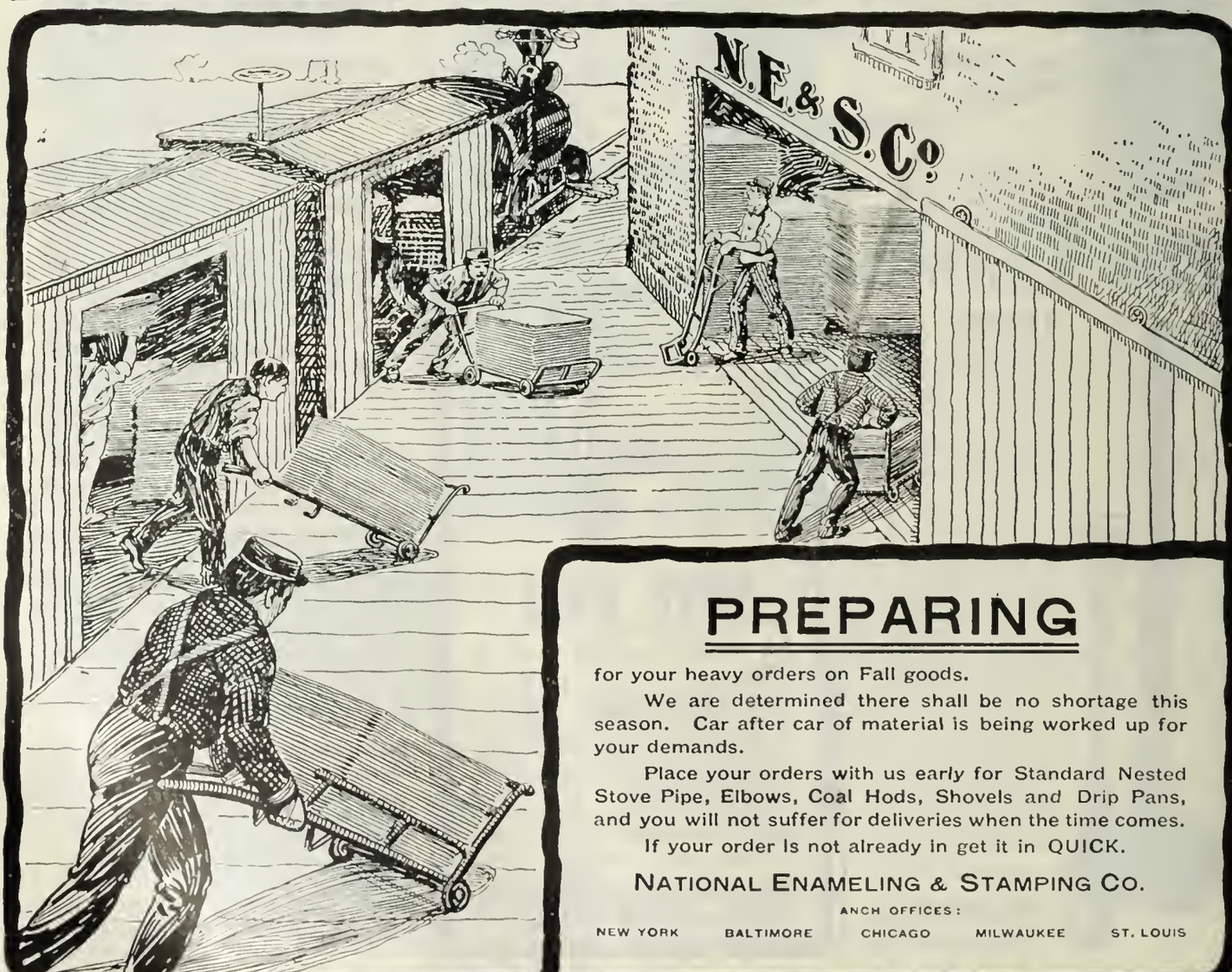
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THE METAL WORKER.

NEW YORK AND CHICAGO.

New York, March 15, 1902.

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Decrease In Iron Production.

The many troubles which beset the blast furnace managers during the past month, in the shape of floods, coke shortage and lack of transportation facilities, conspired to considerably cut down the output of iron and also delayed the starting of additional stacks, which would otherwise have been added to the active list during February. Consequently, the monthly blast furnace statistics published in *The Iron Age* show a falling off in the furnace capacity from 340,612 tons on February 1 to 330,710 tons on March 1. This reduction is mainly due to the fact that in February the records of the active plants, upon which the capacity of active furnaces is based, were considerably below the normal. The actual production in February, a short month, was 1,250,000 tons, whereas the normal make ought to have been at least 75,000 tons larger. It is not surprising, therefore, to find that furnace stocks of iron fell off from 150,200 tons on February 1 to 125,348 tons on March 1, a decline of nearly 30,000 tons. In fact, had transportation facilities been adequate there undoubtedly would have been a further depletion of the slender supply of pig iron held by the merchant furnaces. Although the coke and transportation difficulties are lessening somewhat, it would be expecting too much to look for a full return of the maximum productive capacity during the current month. That, of course, means continued scarcity of iron. After this month, however, we may expect record breaking totals of pig iron production month after month, which ought to ease the situation. A number of new open hearth furnace plants, now under construction, will also be falling into line during the next few months. Meanwhile some fancy prices are being paid for spot foundry iron, and the outlook is for a continuance of high figures.

Peace in the New York Building Trades.

After a fight lasting for six years the warring factions in the building trades unions of New York City and vicinity have buried the hatchet and joined forces, with the object of doing away with the interneeine disputes which have been the cause of so many building strikes during the past few years. Six years ago the Building Trades Council was formed by unions which seceded from the Board of Walking Delegates, and since that time there has been a constant series of strikes and disputes in the building trades, owing to the rivalry between the two bodies of workmen. Twice in the interval they have come together and reached an agreement to amalgamate, but in each case the agreement fell through and failed of consummation. This time, however, it seems that an actual agreement has taken place and the breach is understood to have been finally healed. The settlement was come to at a meeting of the two bodies on Tuesday of this week, when an amalgamated association, to be known as the United Board of Building Trades of New York, was formed, with a full list of officers. Furthermore, a committee has been appointed to provide a constitution and by-laws, a leading feature of which will be a clause providing for the arbitration of all labor disputes. Thus, it is hoped, a period has at length been put to the troublesome and unnecessary interruptions to building operations, through the disputes of the rival unions, which have been afflicting New York City for so long. Already the settlement has resulted in the calling off of a strike involving some 1500 workmen employed on a number of large buildings that are being erected by one of the big contracting concerns. The settlement of this war of unions will be hailed with satisfaction by a long suffering public as holding out the prospect of a new era of improved conditions and the removal of a seriously disturbing factor from the local building industry.

The Tin Plate Situation.

The wage scale agreement between the American Tin Plate Company and the Amalgamated Association, referred to in our last issue, whereby the danger of any prolonged closing down of the tin plate mills this summer by strikes, or pending the conclusion of wage negotiations, is removed, is a matter for congratulation, it being taken for granted that the agreement will be ratified by the lodges of the Amalgamated Association. Can and tinware makers and other consumers of tin plates now feel that they can safely book orders for finished goods for delivery throughout the year without risk of failure to fill contracts through inability to secure material, as happened last year. The conservative attitude of the principal producers of tin plates, too, justifies the confidence that prices will not undergo any radical change for some time to come, unless the unexpected happens and iron prices soar beyond reason, a contingency which seems unlikely to occur. Certainly it is reasonable to conclude that tin plate prices will not recede below their present level for an indefinite time, judging by the remarkable strength of the raw material. All the indications favor a steady market on tin plates through the year, with a demand that will absorb the output of the mills, even if they are kept at their full capacity for the entire twelve months. At present most of the mills are from one to two months behind in their deliveries on contracts, and it will take them some time to get abreast of their current business. It is likely that 1902 will prove a banner year in both the production and the consumption of tin plates in this country.

Retail Hardware Associations

The reports of the annual meetings of State retail hardware associations which have appeared in our columns in the past few weeks give ample demonstration of the vitality of the movement among the retail hard-

ware and stove trade in the direction of organization. It will be evident to those who peruse these reports that many thoroughly representative merchants are among the active friends of the movement, which they are helping along by their identification with it and their co-operation in its work. That representative merchants of character and position are willing thus to give to the trade at large the benefit of their time and thought gives the association movement an important indorsement, which will commend it to those in the trade who are not already identified with it and thus help materially to insure its success. Many of the papers read before the associations relate to questions of so much interest and were discussed in so broad and intelligent a way as to deserve the general attention of the trade. The increase in membership of nearly all the associations during the past year is exceedingly encouraging as giving promise of still further growth. Most of them report substantial progress, and in some this has been very marked. There is evidently an opportunity for a friendly rivalry, not only as to which State is to have the banner association in the matter of membership, but also in the efficiency of its work and the success with which it accomplishes the objects for which it is organized. This is a matter in which very much will depend on the lines on which the association works and the efficiency of its executive officers. It must not be overlooked that new associations are being formed in States which heretofore have not joined the movement, and that in certain States the subject is under advisement, although nothing definite has been accomplished. Many merchants recognize the existence of evils which the association movement endeavors to correct, but while its aims have their hearty approval they are waiting for others to do the pioneer work and prepare the way for the association. The association spirit, while already showing itself an important factor in the trade through the organizations which are now in operation, has an undertone of sympathy and strength among the merchants at large which is only waiting an opportunity to make itself felt.

A National Corporation Act.

A proposal which demands very thoughtful consideration has been brought forward by James B. Dill, who has been conspicuous as a clear headed and discriminating advocate of what is best in the movement toward the consolidation of industrial enterprises. Mr. Dill developed his ideas in an address before the Economic Society of Harvard University, crystallizing his plans for a Federal law in the following, as a basis for future discussion:

"1. It should be optional, as in the case of the National Banking act, leaving corporations free to organize under State acts if they choose.

"2. It should deny the name 'national' to any but national corporations, compelling other corporations who assume that title to change it.

"3. National corporations should have freedom from State supervision and should be subject to taxation by the State only to the amount of property actually in the State, and then upon the same basis as an individual.

"4. A national corporation should possess in every State all the immunities and commercial privileges guaranteed to natural persons by the Constitution of the United States and of the several States.

"5. It should be protected from State attack to the same extent that the national banks are—viz., it should not be subject to attachment or other provisional limitations which prevail in any State against nonresidents—that is to say, being a United States corporation, it should be a citizen of the United States and a citizen of each State, to the extent that it has all rights of citizens as to attacks in the courts.

"6. The national corporation should be subject to national supervision and examination, and should require at least private publicity, which would ultimately result in public publicity.

"7. An annual report should be made by the corporation, showing the taxing situs of all its property. Such information should be collated by some Federal authority and furnished to the taxing officers of the various States, in order that the corporation might be justly and correctly taxed.

"8. A national corporation should pay local taxes upon all its property. Its stock in the hands of stockholders should be exempt from taxation of every nature."

While there are many earnest men who insist that trusts, so called, should be legislated out of existence, we believe that a vast majority recognize that they represent a movement certain to be productive of good to producer and consumer, investor and workman alike. While that is recognized quite generally there is a feeling of fear of the enormous power of these consolidations, when swayed by men either reckless or unscrupulous. There has, therefore, been a growing conviction with the public that some method of control should be devised. Thus far nothing has been brought forward which is not radical and, therefore, unwise. Mr. Dill's proposal for a national incorporation law is moderate and fair. The movement toward consolidation of interests has reached proportions which make it impracticable to deal with it through State laws. The sooner this obvious fact is admitted and legislation is shaped accordingly the better for all concerned.

The export figures of the United States for the month of January and the seven months ending with January, 1902, just published by the Treasury Bureau of Statistics, show an improvement in the outward movement of manufactures. The value of manufactures exported in the month of January, 1902, amounted to $34,412,992, against $32,654,035 in January, 1901. They are the largest shown in any January except 1900, when the total was about $1,000,000 greater. For the seven months ending with January the exports of manufactures were about $73,000,000 less than for the corresponding period of the fiscal year 1901. The January figures, however, hold a promise of an enlarged movement during the present year. Manufactures in that month showed a greater evidence of activity than any other class of exports. This is the only important class of exports which showed an increase in January, 1902, over January, 1901, the agricultural products and the products of the mines, forests and fisheries exported being smaller in amount and value than those of the corresponding month of last year. In the three leading classes of manufactured articles exports of which showed a decline during the past year—illuminating oil, manufactures of copper and manufactures of iron and steel—a decided improvement is noted.

In the statistical abstract lately issued by the Treasury Bureau of Statistics covering the century from 1800 to 1900, some very interesting comparisons are made illustrating the changes in the relative rank of the different States of the Union in the course of the century. At its opening Virginia ranked first in population; in 1900 it ranked seventeenth. Pennsylvania is the only State that held its position throughout the century, having ranked as second in population in 1800 and the same in 1900. New York, which stood first in 1900, was third in 1800. North Carolina, which stood fourth in rank in 1800, was fifteenth in 1900, while Kentucky moved down from eighth in rank in 1800 to twenty-ninth in 1900 and Delaware from seventeenth to forty-sixth. Indiana moved up from twenty-first in rank in 1800 to eighth in 1900, and Ohio from eighteenth in 1800 to fourth in rank in 1900.

THE WESTERN STOVE TRADE.

The influences now prevailing in the stove trade are all tending toward activity and higher prices. The advance in the cost of production caused by the higher prices of pig iron and other materials has fully justified the advance made in the price of stoves and ranges at the beginning of the year. Taking pig iron alone the advance since the month of December has been about 20 per cent., and from present appearances the highest point has not yet been reached. During the past week pig iron developed greater scarcity in Western markets than at any time for many years. The situation in the iron market is really much stronger than during the boom of 1899, when prices were very much higher than they have yet reached this year. The consumption of iron is on a much greater scale. The production has increased fully 25 per cent. over the amount produced during the time of that boom, and yet, notwithstanding this great increase in production, the country is consuming the output easily and demanding still more iron. If the iron trade had not been largely under the control of great consolidations, whose policy has been to keep prices down, the price of iron would ere this have been as high as, if not higher than, anything known in 1899. It would seem, however, that a point has been reached at which the control of the market is passing out of their hands. The Chicago market has seen such prices paid within the past few days as would seem to indicate that a higher level is inevitable.

That dealers generally through the West have recognized these conditions is demonstrated by the freedom with which they have recently been placing orders for all kinds of cooking and heating apparatus for summer and fall delivery. Almost without exception, the Chicago stove houses report an active demand from their customers, so large as to surpass anything of the kind known for a number of years. The stove manufacturers are themselves so convinced that prices are likely to be higher that in notable cases salesmen have been instructed not to accept any orders for delivery after the middle of July. That date is fixed because it is believed that by that time a higher price, and perhaps a considerably higher price, will be made on all sorts of stoves.

The stove manufacturers who held their prices open for a few days before putting the advance in effect at the first of the year are now seen to have made a business blunder. They might as well have reaped the full benefit of the advance from the time that it was first known to be decided upon. The volume of business thus booked was possibly desirable, but it would have been better for their profit and loss account if they had not been so eager to make sales. It looks now as though the manufacturers who limit the time during which they will make deliveries at present prices are acting prudently.

In addition to the advance in cost due to dearer raw material, the possibility exists that the cost of manufacture will be further increased by an advance in wages, The annual conference between the representatives of the stove manufacturers and a committee of the Molders' Union will be held in Chicago on the 27th inst., at which a demand will be made for an advance of 10 per cent. in the wages schedule. It is possible that the outcome of the conference may be the maintenance of the present wages schedule; but this is uncertain. Should it result in an agreement to make the advance asked for, that, in itself, will increase the cost of stoves at least 5 per cent. If such a change is made, it will be absolutely necessary to make an immediate advance in the price of stoves and ranges to cover this increased cost, as the new wages would go in effect on April 1.

In a report to his Government the French Consul at Tiflis, Asiatic Russia, says that a large trade has been developed in that region in Oil Stoves for heating and other domestic uses. Some of those used are of American origin, but the majority come from Berlin. They are used chiefly for heating rooms, cooking and ironing, &c. These Stoves fetch high prices, as the import duty on such goods is high. The Consul adds that all Stoves imported into his district must be accompanied by a certificate of origin.

Furnace Work Records.

Approves of Furnace Work Record.

BY C. E. OLDACRE.

I think that the table presented under the head "Furnace Work Records" should prove very valuable to the trade as a whole, and am glad that it has been given before the heating season has entirely passed. I am satisfied that it will bear fruit, and be highly valuable to every one who makes use of it to record several jobs that have been installed during the season. If such records were then returned to *The Metal Worker* for presentation it would afford all furnacemen an opportunity of looking over the relative proportions of different men's practice and provide them with valuable data. If such a comparison should lead to the correction of errors that have been made in the past, it would also afford a means of correcting them in future.

In my opinion, however, the table hardly goes far enough, or it may be better, perhaps, to supplement it with another rather than to continue it further. I would suggest that it be extended so that it could also give the record of an efficiency test, giving the date of the test; the temperature outside; temperature of each room heated; temperature of air at register; average temperature of house; temperature of hot air at register; area of each flue in wall or partition; length of each cellar pipe; temperature of air in each pipe, not over 3 feet from heater, to show loss from friction and radiation; character of the building, whether stone, brick or frame, and if brick or stone, whether stripped on inside or not. Such tables would be of great value to men who lay out work, but, in my opinion, it would not be of such material benefit as a shop card.

Approves the Record and Comments on Proportions.

BY G. R.

Having studied the article on the "Furnace Work Record" and also the record itself, I think very favorably of the scheme, and am of the opinion that it is very complete as presented. Every point seems to be covered that would be necessary in a general record. If it was filled out, as intended, by some of the furnacemen who are now having trouble with their work, it would be but a short time before they would have no further cause for complaint. Some men may say they have not time, or that it is too much trouble to do the necessary figuring and calculating to fill out the chart properly. Experienced men have no need to do this for smaller and ordinary work, but there can be no question that even their experienced judgment would be benefited by a reference to such a well kept record for some of their larger or unusual work.

I could not help but notice that some of the proportions must digress a little from a direct consideration of the chart. What I wish to point out, however, is that the more heating surface a furnace has to a square foot of grate surface the more economical and satisfactory would be the results, and with a smaller quantity of fuel. If a furnace was proportioned with 1 square foot of grate surface to 30 square feet of heating surface it would heat 66,000 cubic feet of space instead of 37,000, and with from 10 to 15 per cent. less fuel. I will illustrate the problem this way: A grate 30 inches in diameter has an area of 4.9 square feet; therefore, if 30 square feet of heating surface is provided for every square foot of grate surface, it would expose 147 square feet. In ordinary work, every square foot of heating surface, where the exposure is not too great, will take care of 450 cubic feet of space. For work where the exposure is very great I would not recommend that 1 square foot of heating surface be depended on to heat more than 350 cubic feet of space. This would be taking the safe side, and I feel that there is no doubt that a furnace proportioned as I have said would do the work if it is properly located and connected.

Furnaces, as a rule, have their grate surface better proportioned for the amount of work to be done than

the heating surface is proportioned to the grate or work. This is due to the fact that it is easier for the manufacturers to give larger heating surface to small grate surface than it is to provide the requisite amount of heating surface when a large grate surface is used; consequently, the grate surface is expected to do the work that the radiating surface should do, and the result is that furnaces soon burn out. What is needed in furnaces is more radiating surface. Has there ever been any rule for determining a hot air job that will provide a temperature of 70 degrees in zero weather, no matter what the temperature outside may be when the test is made?

DEATH OF GEORGE H. HOLLAND.

George H. Holland, vice-president of the Bridge & Beach Mfg. Company of St. Louis, Mo., died of cancer of the throat, at St. Luke's Hospital in Chicago, on March 16, after an illness of six months, during which he was a great sufferer. Mr. Holland was born on May 2, 1847, in Dublin, Ireland. He went to St. Louis in 1853 with his parents, and in 1868 entered the employ of



GEORGE H. HOLLAND.

the Bridge & Beach Mfg. Company as a bill clerk. On the retirement of John H. Beach from the firm, in 1872, Mr. Holland was given an interest in the business, which was materially increased in 1875, at the death of H. E. Bridge, Sr. His advancement in the business was steady until he attained the position of vice-president. The company prospered greatly under his management, and it is largely due to his efforts that they are to-day not only one of the oldest, but one of the most solid and progressive concerns in the stove and range manufacturing business in the United States.

Mr. Holland was energetic and systematic in all of his transactions, and was ever ready to encourage those under him who showed a disposition to work. His Northern Irish disposition rendered him exceedingly conservative and cautious, and it was a fixed rule of his from early boyhood never to involve himself in debt for even the necessities of life. His policy was to pay as he went, and this policy justified itself to a marked degree in the success of his personal management of the company with which he was associated. He was retiring in his habits and never courted publicity. He declined several directorships in banks and other financial institutions, preferring to devote his entire time to the interests of the Bridge & Beach Mfg. Company.

Mr. Holland had planned to retire from active business life this year and devote five years or more to travel with his wife and daughters. Last August, accompanied by one of his daughters, he went abroad for the purpose of making an extended tour of Europe. When he reached London he was very ill, suffering from what seemed to be an abscess in his throat. On consulting a specialist it was pronounced to be a cancer. Dr. Butlin, the eminent English surgeon, performed an operation on August 29, and Mr. Holland remained in a private hospital in London until November 1, when he abandoned his traveling plans and returned to St. Louis. Shortly after his arrival there he experienced a recurrence of his malady and, upon the advice of his physician, went to Boston, where a second operation was performed on December 1. He remained in a hospital in that city until early in January, when he returned home. In the middle of the month, however, he went to Chicago and began a course of treatment at the St. Luke's Hospital, which was attended by gratifying results. He remained there in the hope of his permanent cure, but in the early part of last week a change for the worse developed in his condition, and he rapidly sank until his death on Thursday. Mr. Holland married, in 1879, Miss Nora Wilcoxson of Carrollton, Mo., who, with two daughters, survives him. He was a member of the St. Louis, Noonday, Country and Commercial clubs of St. Louis, but took no part in secret or fraternal organizations.

Death of R. McDougall Campau.

R. McDougall Campau of the Peninsular Stove Works, Detroit, Mich., died on March 2 at his home in that city, aged 45 years. For the past two years he has been an invalid, and had resided in a sanitarium, but recently he returned home in apparently improved health. Mr. Campau was born in Detroit 45 years ago, his father, Alexander M. Campau, being one of the wealthiest real estate holders of that city. R. McDougall Campau was one of the organizers of the Peninsular Stove Works, in which he occupied a responsible position until forced to retire from business on account of ill health. He was also connected with a number of other business enterprises in Detroit, and was prominently known in amateur athletic circles. He is survived by a widow and two daughters. The funeral took place on March 4 from the family residence, 189 Parker avenue.

Crane's Gas Cooking Appliances.

The William N. Crane Company, with main office at 1131 and 1133 Broadway, New York City, have issued the spring edition of their catalogue of gas appliances for cooking and manufacturing purposes. The publication, known as Catalogue No. 21, consists of 80 pages, profusely illustrated and bound in red paper covers. The work briefly sets forth the principal features of the company's gas appliances offered for 1902, the line comprising too many articles to permit of a presentation of full particulars concerning each and every one. Special attention, however, is called to the fact that the Vulcan and the Perfect ranges this year embody several new and valuable features; but, as the company say: "Changes for mere talking points have always been avoided, such alterations leading to complications in furnishing repairs." They state that they long ago recognized the supplying of parts as a very important thing. Their practical experience in New York, where they have supplied thousands of rental ranges, has given them the opportunity of meeting all requirements in this line, and in the construction of their ranges they have taken into consideration the easy renewal of all parts for repairs.

The concern are the sole agents for the Perfect ranges, made by the Gem City Stove Company of Dayton, Ohio. In addition to the ranges mentioned, attention is given to broilers, carving tables, plate warmers for hotels and private families, cake griddles, waffle stoves, oyster cookers and stewers, automatic coffee and tea urns, water urns, chafing dish stoves, the Vulcan Giant burner, tailor and laundry stoves, gas irons, ovens, hot plates, toasters, coffee roasters, gas stove fittings, &c. The company announce that they issue three catalogues, one in a red cover, relating to cooking appliances; one in a green cover, describing their heating appliances, and one in a blue cover, relating to Bray burners. Accompanying the catalogue is a special price-list and discount sheet, and also a price-list of gas fixture fittings.

STOVES.*

BY A. ROTHWELL, HAMILTON, OHIO.

The subject assigned me is one that volumes might be written upon, and he who sells them often finds that stoves are rather a warm subject in more ways than one; for it is a usual occurrence for him to receive cheering and happy greetings from his customers and friends, especially during the first cold snaps of winter.

History informs us that even before the time of Christ the early inhabitants of the old world used braziers, in which they burned charcoal, for the purpose of not only heating the room in which the apparatus was, but by means of hollow walls the heat was conducted to other apartments of the building.

It is generally conceded that the Franklin was one of the first of American stove products, but some of our English brethren contend that our own Benjamin got his ideas from their open fire places.

IMPROVEMENTS IN STOVES.

The old six-plate box heater, for wood, was first made in Ohio about the year 1830, and as there were no foundries west of the Alleghanies the patterns were shipped to Maryland to be cast. The old high oven step stove soon after made its appearance, and as various foundries were springing up in almost every section of the country we find that in the year 1860 many Ohio towns could boast of their foundries making stoves; however, only in a limited manner. The dealer of to-day occasionally runs across one of these old relics, and no doubt it soon finds its way to the old scrap pile.

The ancient type of both heating and cook stoves has been supplanted by the modern steel range, gas range, base burner or air tight, and it can truthfully be said that no household article has had so many improvements or so vast an amount of money expended on it as the kitchen stove or range.

THE STOVE INDUSTRY OF TO-DAY

is quite an important factor in the iron and steel market, being one of the largest consumers. Some of our stove foundries of the present day cover acres of ground, employing hundreds of skilled mechanics, and the owners of which are sparing neither time nor money to make the American stove far superior to any heating or cooking apparatus in the world.

Stoves are nowadays essential to every home, and the dealer should impress on his customers that the peace and happiness of the entire household depend upon the kitchen stove or range, for it is said "the way to the average man's heart is through his stomach."

Living as we do in such a progressive age and with manufacturers of stoves keeping up with, and in many instances ahead of, the procession, it seems hard for the ordinary hardwareman to keep thoroughly posted on round flues, square flues, hot or cold blasts, slide drafts, down drafts or screw drafts, simplex or duplex base burner, air tight or 60-hour heater.

THE RELATION OF THE MANUFACTURER TO THE RETAILER

has been, up to a few years ago, pleasant and profitable, but as conditions have changed certain rules have been adopted by the manufacturers, which have caused some little murmurings of discontent from the retailer, the latter holding that he is compelled to stand the brunt of all complaints and losses. Owing to severe competition in his special district he is not getting profit enough for the amount of work necessary to conduct his business; obliged to claim damage for breakage from transportation companies; compelled to meet price on same make of stoves sold by the crossroad grocery man, who does not carry a line of goods on his floor but simply sells from catalogue. The department store likewise of late makes his business life troublesome. Personally I can say that some of these grievances could be amicably settled if we, as retailers, would keep up with the times and do as our manufacturer does, who is not content with being a member of a national association, but likewise has his Eastern, Western, Southern, Ohio Valley, and in many instances local associations for his protection and welfare.

*Paper read at the eighth annual convention of the Ohio Hardware Association, at Columbus, February 25 and 26, 1902.

HANDLING STOVES.

Permit me, if you please, to enumerate a few of the pleasant and unpleasant features of handling stoves. How pleasant it is, after having driven some 10 or 12 miles in the country, especially on a cold day, to look after a sick stove (one the good housewife claims will not bake on the bottom, cannot do a measly thing with it, is thoroughly disgusted and makes her complaint in such tones that every customer in the store has heard her, says she has tried and tried to bake and she won't try again), to find when you look at the job of setting up this stove that the pipe is too far in the flue, or that the chimney is too low, open grate in the same flue, or the good lady did not know that the damper should be turned up for baking. Then it is that you wonder whether some people have any sense.

Now that gas ranges are being used extensively it is advisable to inform your customer that the pilot is for lighting the oven burners, and that it is practically useless to light burners by holding a match in the air mixer. And we often find that the reason Mrs. Brown's stove does not work satisfactorily is because she wants a range like her next door neighbor. Another very pleasing incident is to have a customer bring back to you a bundle of castings, that will not fit his stove, simply because he gave you the wrong number. But then a stove is such a simple proposition that it should work anywhere, consequently the dealer should be content and always be courteous, for he will undoubtedly receive his reward in the bright hereafter.

Maple Leaf Stoves.

B. C. Beech & Co., Winchester, Ontario, have issued a catalogue devoted to the Maple Leaf stove, showing on the front cover a maple leaf in bronze, upon which is printed a picture of one of their Maple Leaf ranges. This stove is made both as a range and a cooking stove, with 8 and 9 inch holes, and ovens 18 x 19 and 20 x 21 inches. The stoves are provided with indestructible fire backs and duplex grates and with tops made in sections, to insure against cracking. They are also furnished with reservoir and high shelf and all of the modern conveniences. The design, which is elaborate and attractive, is embellished with nickel trimmings. One page of the catalogue is devoted to a crematory closet for use in buildings where is no sewerage and another to the Winchester acetylene gas machine, which is constructed with cast iron generators to operate automatically and made without soldered or wiped joints, having no valves or complicated parts. The machine has been widely sold in Canada, where it is said to have given excellent results. The company have a special catalogue devoted to this apparatus.

An American Heater on a Crater.

"What gratifies all foreigners most after driving three or four hours in a cold wind to the crater of Vesuvius," writes W. E. Curtis, who is traveling in Italy, to the *Record-Herald* of Chicago, "is the presence in the reception room of a Crown Jewel base burning coal stove of American manufacture, giving a warm, cheerful welcome to the chilly visitor." As more than half of the visitors to Vesuvius are said to be Americans, that Crown Jewel is apt to make an impression that will be felt when a stove is needed after reaching home. It might be a good idea to have more Jewels and other American stoves placed where the traveler will form a correct appreciation of their unapproached value, and be induced to ornament his home with such a heater.

THE profits of the John Wright & Eagle Range Company, an English Stove manufacturing concern, for last year, after strengthening the internal reserves, charging directors' fees, managing directors' remuneration and depreciation on the building and plant, amounted to $225,000. This means a dividend at the rate of 6 per cent. per annum, carrying forward $50,000 to reserve fund and $48,000 to next year. It will thus be seen that at least one firm of Range manufacturers in Great Britain is in a very prosperous way.

FURNACE WORK SHOULD BE DONE MORE SCIENTIFICALLY.

BY S. N. D.

Several articles appearing of late in *The Metal Worker* have indicated the increasing popularity of warm air heating for the better class of residences, churches, &c. Whether warm air heating from a central plant is to take its old place and again assume the position it held before it was displaced by direct radiation of steam, and later hot water, depends entirely upon the degree of intelligence used by furnacemen throughout the country.

Fifteen or 20 years ago warm air plants were put in two-thirds by guess work. The cubical air contents of a room was usually figured out, but very little attention was paid to the number of heat units lost in a room through glass or equivalent glass surface. The amount of friction to the air caused by angles in the pipe, the conductivity of materials through which wall pipes are run and their relative exposure, were seldom considered with any care. This haphazard method of installing furnaces and wall pipes caused a reaction against such an uncertain method, and created the demand which resulted in the introduction of direct radiation of steam, and afterward hot water, for the better class of residence work.

Now, however, that brains are beginning to be used in the erection of warm air plants, is there not a growing tendency to return to the older form of heating where it is possible? Is not the sanitary side of direct steam and hot water receiving daily more attention among careful architects and owners? Is it not now beginning to be recognized that a system which makes no provision for the supply of fresh air to living rooms cannot retain permanent popularity? Is not more careful study given than ever before to the best method of keeping a room heated without materially altering the proportion of carbonic acid gas in the air?

These questions are all of vital interest to the furnacemen, because an honest answer will show that a revival of warm air heating for the higher class of residences will surely come if the trade will use their heads as well as their hands in the erection of plants. Within the past two or three years central warm air systems have been installed in some of the largest and most handsome private residences in the country, and have been found to heat them thoroughly and evenly, and at the same time provide a proper supply of fresh air. It has thus been demonstrated that, when attention has been paid to certain fixed natural laws, a warm air system closely approaches the ideal.

If, therefore, a return to furnace heating is due, every one interested should use his best efforts to know how to correctly design and install an entire system in such a way that it will increase the popularity of warm air heating. Furnace work should not be confined merely to making pipes, elbows, setting furnaces, &c.; it should include laying out the plant complete, with due regard to natural laws. The average furnaceman does not realize the supreme importance of these natural laws and their application to his particular business. Air is much more difficult to control than steam or water, and therefore it should receive very careful study.

To make furnace heating a success one should be able to figure not merely the cubical contents of each room, but, approximately at least, the number of heat units lost per hour through the glass, wall and crevices, and through the chimney or ventilation flue. Then he should be able to estimate the size of wall and cellar pipes and registers necessary to deliver the required number of heat units per hour into the room. He should be able to establish a proportion between the equivalent glass surface, cubical contents and capacity of pipe, and take this proportion into account in determining the relative value of each pipe. He should at all times make provision for the length and pitch of pipe, the angles incurred, the location of wall pipes, and the consequent number of heat units lost in passing from the furnace to the room heated. He should be able to figure the proportion between the heating surface of the furnace and number of heat units required. He should know how to figure the velocity of his various pipes at different distances from the furnace. He should also be able to establish the best method of air circulation.

Having treated each room separately, he should then place his heater where, for each pipe, the proportion between the number of heat units required and the pipe area—after due provision is made for length, pitch, angles and exposure of pipes—would be as nearly equalized as possible. He should, of course, know how to figure the required size of his cold air inlet and the best place from which to take his air. Even then the furnaceman would not necessarily make a success of his plant if he did not add to his computation good, hard, common sense. To revive the popularity of furnace heating every man in the trade should have a comprehensive theoretical knowledge. But unless knowledge of this character is generously disseminated for the benefit of the whole furnace trade the knowledge is worthless for advancing the popularity of this method of heating by improving its application.

As soon as the dealer comes to realize that a thorough understanding of his own business is the chief factor in his success and puts his knowledge into practice; as soon as the furnaceman learns to give up saying, "I can do your work cheaper than my competitor," and substitutes, "I can do your work better than my competitor;" as soon as the furnaceman understands that while slipshod work may increase his profits on one job it will eventually bring not only himself, but the whole furnace trade into disrepute, then the popularity of warm air heating will take such a bound that furnacemen will find that they have no "dull season."

STOVE AND FURNACE EXHIBITS AT THE IOWA HARDWARE CONVENTION.

At the fourth annual meeting of the Iowa Retail Hardware Dealers' convention, held at Cedar Rapids last week, the parlors of the Grand Hotel, the official headquarters, were largely given over to exhibits by manufacturers and jobbers and to representatives of trade interests who had secured them for reception purposes. Seldom has a convention been so well served with attractive features of this character. Prominent among the concerns represented were several stove and furnace houses, who made exhibits or distributed souvenirs, among which the following may be mentioned:

The Joliet Stove Works, Joliet, Ill., displayed nine samples of heaters, steel ranges and steel cooking stoves. The ranges comprised Moore's steel range, Moore's Premium range, Moore's Monarch range and Moore's Merit range. The cooking stoves embraced the Steel Gem, a specimen of the first steel cooking stove made, and the Medal, a fine piece of work in the steel line, having an aluminized cast base. The heaters comprised a sample of Moore's original air tight, a standard oak and a hot blast oak. J. B. Reeve and C. L. Featherstone were in charge.

H. L. Mosher and J. L. Parker ably represented the Round Oak Stove Works, Estate of P. D. Beckwith, Dowagiac, Mich. The parlor, known as the Indian Village, was never without callers. They distributed Doe-wah-jack nickel-plated match boxes and Round Oak stick pins.

A. J. Collins of the Majestic Range Company, St. Louis, not only favored his visitors with beautiful aluminum trays, but also each morning decorated everybody's coat with a carnation, and kept the president's table in the convention hall supplied with fresh bouquets.

E. B. Waterman of Black & Germer, Erie, Pa., hospitably entertained his numerous callers. He distributed celluloid buttons bearing a representation of the firm's widely known Air Blast. Mr. Waterman discourses on the merits of Radiant Home stoves and ranges to dealers in Iowa, Southern Minnesota, South Dakota and large lake cities.

L. K. Wynn of the Gem City Stove Mfg. Company, Quincy, Ill., held forth on the merits and original features of the German heater to numerous visitors. His parlor was decorated with festoons of pretzels and

Frankfort sausages, while pictures of Prince Henry adorned the walls, the whole arrangement constituting a striking allusion to the name adopted for the company's popular heater. He distributed artistic stick pins of appropriate design.

The Brown-Hurley Hardware Company, Des Moines, Iowa, exhibited a number of samples of Estate stoves, manufactured by E. and L. Kahn & Bros., Hamilton, Ohio.

The Cole Mfg. Company, Chicago, showed 11 samples of Cole's original heaters. These comprised the well-known Cole's hot blast for coal and air tight for wood. The hot blast stove was shown in five sizes, running from the smallest pattern to a mammoth construction. The air tights were shown in six styles and sizes, embracing a variety of types and finishes. E. L. Duquette was in charge.

The Peninsular Stove Company, Detroit and Chicago, exhibited a large number of photographs of their stoves and ranges. They further exhibited models of the Peninsular line of furnaces. W. R. Yandall, manager of the company's Chicago branch, was in charge, assisted by H. L. Rossman, A. J. Ross and H. P. Knowlton. They distributed leather-covered memorandum books, which were highly appreciated.

W. C. Henry, representing Taplin, Rice & Co. and May & Fiebeger of Akron, Ohio, displayed a number of photographs of the former's Climax stoves and ranges and showed models of the latter's air blast furnaces.

W. J. Heald, representing the Lenox Mfg. Company, Marshalltown, Iowa, exhibited a model of their Torrid Zone furnace, as well as samples of the Wireton time draft regulator and the improved Orr register.

Among those representing similar interests, the following were in attendance at the convention:

John K. Wilson and W. B. Barney, Fuller-Warren Company, Milwaukee, Wis.
William Snell, C. Sidney Shepard & Co., Chicago.
J. H. Farquharson, M & D Range Company, Chicago.
Chas. Smith and C. V. Riley, Chas. Smith Company, Chicago.
J. W. Patterson, Cribben & Sexton Company, Chicago.
George E. Willsie, Keith Furnace Company, Des Moines, Iowa.
A. X. Smith, Quick Meal Stove Company, St. Louis, Mo.
J. C. Bosworth and C. W. Stewart, Michigan Stove Company, Detroit and Chicago.
A. A. Swan, Economy Furnace Company, Cedar Rapids, Iowa.
P. A. Pamplin, Buck's Stove & Range Company, St. Louis, Mo.
F. T. Carroll, Malleable Steel Range Company, South Bend, Ind.
I. M. Walters, Bridge & Beach Mfg. Company, St. Louis, Mo.
E. H. A. Van Sittert, Culter & Proctor Stove Company, Peoria, Ill.
A. B. J. Moore, Rock Island Stove Company, Rock Island, Ill.
H. H. Roberts and Geo. W. Cope, *The Metal Worker*, Chicago.

SOME DATA FOR FURNACEMEN.

BY S. D.

The correspondence which I have had with another furnaceman resulted in the following questions being presented to me for answers, and as I see that furnacemen are now all looking to *The Metal Worker*, on account of its interesting articles on furnace work, I give the questions received and the answers sent in return as of possible interest. I hope that furnacemen who can answer any of the questions better or who think my answers need supplementing will not hesitate to give their views and practice.

THE QUESTIONS.

How many heat units do you calculate are lost through glass?

How do you calculate the equivalent glass value of brick and frame buildings?

On what basis do you calculate the grate surface necessary for heating a building?

Has the grate surface any relation to the glass surface, equivalent glass surface or space heated?

What allowance do you make between church, school and residence heating?

On what basis do you arrive at the size of wall and cellar pipes?

What proportion do you consider necessary between the cellar pipe and flue area and the space heated and equivalent glass surface?

How much do you calculate is the loss in heat units in the hot air pipe between the furnace and the register?

How do you calculate the heat units derived from the heating surface in a furnace for heating a building?

What do you rate the difference in velocity in hot air pipes of different size and length to different floors?

THE ASSISTANCE TENDERED.

Those who read these questions will see that I had to do some studying and reading that is ordinarily out of the furnaceman's line; but as I had volunteered I felt the necessity of rendering some assistance, if not furnishing answers. My answers may seem unsatisfactory to the graduated engineer as well as to those eager for information, but such as they are, here they are:

It is more or less difficult to give any fixed rule of proportion for all furnaces, as they vary so much in heating surface. The proportions I use are those which tests have proven are best adapted to the particular apparatus I am interested in. To reply to the various questions, I would say:

It is generally accepted that the heat transmission of glass is approximately 80 heat units per square foot per hour when the inside temperature is 70 degrees higher than the outside.

Pine has about one-sixth the heat conducting power of glass, oak about one-fourth, brick about three-fourths. As frame buildings cannot be constructed as tight as brick, the relative heat transmitting power of brick and wood can, for practical purposes, be reckoned at approximately the same. If the building is of brick or frame, well built, the proportion between the heat units lost in wood, brick and plastering and the number lost in glass is about 8 to 1. If the building is of frame, poorly constructed, the ratio should not be over 5 to 1. The ratio for floors over cellar and ceilings under attics should be about 12 to 1. Outside doors should be about 2 to 1. Of course to reduce the frame and brick surface to equivalent glass surface, divide the exposed wall surface by 12, 8, 5 or 2, as the case demands. Add this result to the glass surface and you have the equivalent glass surface.

Your two questions in regard to the basis of calculation of the grate surface necessary for heating a building, and whether or not it has any relation to the equivalent glass surface or space to be heated, seem to be so closely allied that they do not appear to require separate answers. I have no fixed rule for all sized furnaces, but, speaking in a somewhat general way, I usually figure that 1 foot of grate surface will take care of about 600 square feet of equivalent glass surface and from 7000 or less to 12,500 cubic feet of contents. Personally I prefer to use the heating surface as a source of deduction. Although 1 square foot of iron surface has about 35 times the radiating power of glass, the number of heat units lost in the pipe and by ventilation will make the proportion 1 square foot of heating surface in heater to 15 of glass.

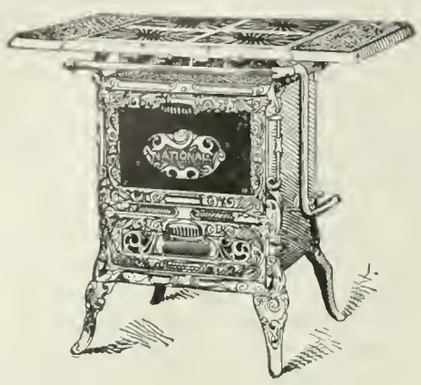
The proportion between piping and cubical contents and equivalent glass surface is dependent to an extent upon the pitch, length and angles of pipe, and the importance and character of the room to be heated; but when allowance is made for these points the proportion should be, in my opinion, about 1 square inch of pipe area to about 32 cubic feet of air space, and about 1 square inch of pipe area to about 1½ square feet of equivalent glass surface.

The loss of the heat units between the heater and the registers is dependent upon the temperature of the air inside the pipe and outside and the length of the pipe. Tin, unprotected by asbestos paper, has about 30 times the heat transmitting power of glass. From this it is not a difficult matter to compute the number of heat units lost in a cellar or outside wall.

The South Pittsburg Stove & Foundry Company's plant at South Pittsburg, Tenn., consisting of Stove and Soil Pipe foundry, mounting and finishing sheds, warehouses all fully equipped with modern appliances, and 11 acres of land in the center of the town, together with stock of made up Stoves, has been sold to A. G. Riley of Huntington & Riley, Memphis, Tenn., for about $36,500. It is said that the new owners will operate the plant at an early date.

The National Acetylene Gas Stoves.

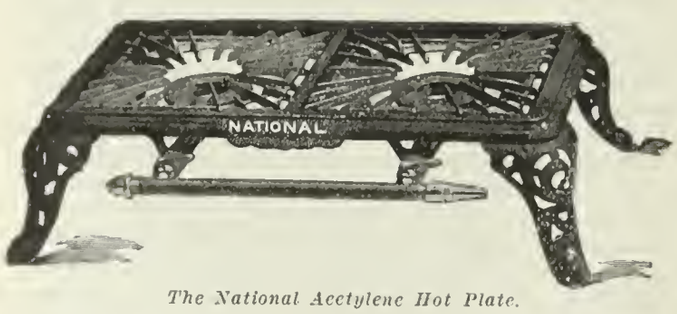
The excellence of acetylene gas as an illuminant has led to the wide introduction of acetylene gas generators throughout the country, and with this has come the demand for a heating and cooking apparatus to use the same gas. Some difficulty has been experienced heretofore with the production of a practical stove. In the accompanying illustrations we show the National acetylene cooking stove and hot plate, made by the National Stove & Illuminating Company, 909 New England Building, Cleveland, Ohio. The National four-burner range and oven is shown in Fig. 1. The success of this stove is



The National Acetylene Gas Stoves. Fig. 1.—Four-Burner Range with Oven.

said to be due to maintaining under all conditions a proper proportion of air and gas in the mixture sent to the burner, which result has been accomplished by means of the special construction presented in the National stove. Another drawback that has been experienced with all gas stoves is flashing back, or lighting back to the gas supply orifice. This, it is claimed, has been entirely overcome in the National stove, and the air mixer is so constructed that it can be readily adjusted to suit any conditions. The combustion is also of such a character as to generate the desired heat without waste, and the advantage of the gas stove can be enjoyed by those who have an acetylene lighting plant under economical conditions.

In Fig. 2 is shown a two-burner hot plate adapted for acetylene gas. The company claim that these stoves, with a small consumption of gas, generate a great heat



The National Acetylene Hot Plate.

without odor. The flame is clean and they operate under a pressure of 2½ inches of water and upward. The gas is burned from 3-16-inch holes in the burner, which prevents choking up or overheating. The company issue, under date of March 1, a neat catalogue and new trade price sheet, giving full particulars of their goods. They also manufacture acetylene burners for lighting purposes.

The annual meeting of the Fuller & Warren Company was held on March 5 at the general offices of the company in Troy, N. Y., when the following directors were elected to serve for the ensuing year: John Johnston, J. A. Roundy, William Plankinton, George L. Graves, H. A. Viets, J. E. Hansen and Arthur N. McGeoch, all of Milwaukee, and W. P. Warren, Troy, N. Y., and Walter Thompson, Garretson, N. Y. Of these the only new member of the board is Mr. McGeoch. The annual report showed the company's business to be in a gratifying condition. During the past year the concern have erected a large addition to their plant, and at the present time the entire plant is being run to its fullest capacity.

WHAT A FURNACEMAN SHOULD KNOW.

BY H. M. K.

Referring to the article by "O. N. E." in *The Metal Worker* of March 1, I would say that a furnaceman of any experience should know, first, that it is an utter impossibility to force cold air from the floor of a room down stairs, then up a cold flue between studding into a cold air attic, by simply letting warm air from a register over the furnace into the room. In cold weather my experience has been that cold air rushes down from the attic, and in order to get the circulation "O. N. E." writes about one should have a warm flue. Secondly, in the way builders now construct wooden houses with balloon frames there is no such flue between the studding extending from cellar to garret. At every story, if not oftener, headers are put across, filling up the space between the studs, rendering it impossible oftentimes to run even a gas pipe up between the studs without a good deal of trouble.

I recently had some experience in ventilation for the circulation of air in a church where eight or ten flues in brick outside walls had been left extending from basement to attic, the attic being well ventilated. At the base of the flues in the audience and class rooms wheel registers had been placed to allow the escape of the foul air from the floor to the attic, as "O. N. E." suggests. Now the theory that the cold air will be forced up by the warm air sounds very well, perhaps, but the actual experience was that cold air came rushing down these flues, making it not only necessary to close those wheel ventilators, but to keep them closed or freeze out the audience. By putting a gas pipe round the room and putting a gas jet with a Bunsen burner into each flue we overcame the difficulty and secured a splendid circulation, but the gas bills were "out of sight," and the project, after a few months, was abandoned and the wheel ventilators closed again on account of the expense.

Theory and practical experience are two different things. How to exactly control air currents in furnace heating is a problem not yet solved by a long way. Referring to the editorial on "Furnace Air Supply" in the same issue of *The Metal Worker*, I would say that my experience is that a liberal supply of indoor air taken through a register in a hall, especially since *portières* are used in place of doors, is the most satisfactory and economical way of supplying a furnace with air. I will confess that my ideas have changed in 25 years of experience along these lines. I think both inside and outside air supplies are best, as the cold air from outside is often shut off in severe weather, while with a double supply it may be shut off without disadvantage to the furnace.

ODD PLATES.

The Excelsior Steel Furnace Company, Chicago, after negotiations covering several months, have made arrangements for the enlargement of their quarters at 38 and 40 West Monroe street. They will add three more stories to the rear of their building, covering a space of 44 x 100 feet. This enlargement will give the company nearly 20 per cent. of increased floor space. They have occupied this building for nearly ten years, and during that time they have considerably increased its size. The company have further secured options on about 20,000 feet of space in an adjoining building, of which they expect to get possession in a few months. They will then have in use over 2 acres of floor space.

The Columbus Stove Works, which began operations July 1, 1901, at Columbus, Ohio, were incorporated at the beginning of the year under the title of the Columbus Stove Company. The business since its inception has been successful, the company leasing the entire plant of the old Eugler Foundry on Main street, in order to meet the demand for their principal product, the Columbus Steel Plate Range, which embodies many features of merit and is adapted for hard or soft coal, coke,

wood or natural gas. Since taking possession of the foundry the company have entirely remodled it and equipped it with the latest improved machinery especially adapted to their work. The directors of the company are: F. B. Everett, president and treasurer; John W. Hastings, vice-president and manager; J. C. Campbell, G. A. Welling of the Welling Mfg. Company and L. Ewing Jones. J. W. Hastings, the founder and manager of the business, has had over 20 years' practical experience.

The Ferris Stove Company, St. Louis, Mo., have secured control of a lot 280 x 137 feet at Twenty-second and Pepin streets, and will, it is said, erect thereon a large manufacturing plant.

The Economy Furnace Company, Cedar Rapids, Iowa, are manufacturers of Hot Air Furnaces of the tubular type and the divided flame type. The tubular type has a number of vertical cast iron flues through which the air passes when heated, while the divided flame type has the dome over the fire pot connected with the radiator by special openings on the circumference, thus dividing the flame into several columns, allowing a free mixture with air in insuring complete combustion. The divided flame Furnace is especially suited for the use of soft coal for fuel. The company are heating and ventilating engineers and take contracts for heating large buildings, such as court houses, schools, &c. A. T. Averill is president, George B. Dutton vice-president, W. H. Durin secretary, Glenn M. Averill treasurer, and E. R. Swan general manager. Mr. Swan was for many years connected with the Williamson Heating & Ventilating Company of Cincinnati as heating engineer.

Charles Nowak, who for 22 years had been employed by the Cribben & Sexton Company, Chicago, died suddenly in that city on the 6th inst., from an affection of the heart. Mr. Nowak had for many years been the company's Chicago salesman and was widely known and highly esteemed in the local Stove trade. A widow and several children survive him.

The Cook & Van Evera Company, 38 and 40 Lake street, Chicago, are Western agents for the sale of the Enterprise Odorless Instantaneous Blue Flame Oil Stove. This is a Stove which burns with a wick. The burner, however, is constructed on a new principle by which two currents of air are so commingled in securing the combustion of the oil that when the wick is raised to the proper hight the flame thus made is perfectly blue and produces an intense heat. The peculiarity of this burner is the fact that it lights instantaneously and emits no odor, either when the flame is first started or when it is extinguished. The wick raising device is new and is claimed to be constructed on a principle which prevents it from getting out of order. The wick is round and very thick and one will last an entire season. The Cooking Stoves made on this principle comprise a full line of two or three burner Stoves which are handsomely constructed with sheet steel frames, designed in cabinet styles.

Caldwell Furnace Foundry Company of 419 Market street, Camden, N. J., have been incorporated to manufacture Furnaces, &c., with a capital of $300,000, by James W. Caldwell, Curtis F. Johnson and Charles R. Clapp.

IOWA RETAIL HARDWARE DEALERS' ASSOCIATION.

In our issue of last week we printed a report of the proceedings at the opening of the fourth annual meeting of the Iowa Retail Hardware Dealers' Association, held at Cedar Rapids on March 4, 5 and 6. At the session on Wednesday morning Chairman Jacob Seither of the Executive Committee reported that the books of the secretary and treasurer had been audited and found correct.

President W. A. McIntire then read his annual address, which was vigorously applauded and awarded a rising vote of thanks. The president appointed a Press Committee consisting of S. R. Miles of Mason City and George W. Cope of *The Metal Worker*.

At the evening session members of the Executive Committee for the ensuing year were elected as follows, each Congressional district being entitled to a representative of one member on this committee:

1. Jacob Seither, Keokuk.
2. Clarence Philips, West Liberty.
3. L. Lindenberg, Dubuque.
4. T. J. Lomas, Cresco.
5. C. S. Schmidt, Marshalltown.
6. Homer M. Duncan, Albia.
7. L. H. Kurtz, Des Moines.
8. C. R. Keating, Mt. Ayr.
9. Charles Swaine, Council Bluffs.
10. H. S. Vincent, Fort Dodge.
11. W. H. Millard, Cherokee.

The appointment of the following committees was made by the president:

Resolutions: Charles Swaine, Council Bluffs; J. F. Nelson, Fort Dodge; N. B. Twogood, Mount Vernon.
Constitution: H. S. Rayhurn, Mason City; Clarence Philips, West Liberty, and L. H. Kurtz, Des Moines.
Nomination of Officers: L. Lindenberg, Dubuque; G. H. Thorley, Atlantic, and George Staehle, Earlville.

S. R. Miles of Mason City read a paper on "Credits," which was discussed at great length, the subject proving to be of much interest to the members, and C. F. Schmidt of Marshalltown read one on the "Relation of the Jobber and Retail Dealer."

On Wednesday afternoon H. G. Cormick of Centralia, Ill., treasurer of the National Retail Hardware Dealers' Association and president of the Illinois Retail Hardware Dealers' Association, addressed the convention, after it had spent some time in executive session.

At the Thursday morning session Clarence Philips read the report of the Committee on Constitution, in which several changes were recommended, some of which were adopted and others rejected. Papers were then read by George Staehle of Earlville on "Trusts in Their Relation to Retail Dealers," and L. Lindenberg of Dubuque on "Our Competitors."

Charles Swaine reported that the Executive Committee had held a meeting and had elected W. H. Keating of Ottumwa secretary and George S. Lister of Manchester treasurer for the ensuing year. They recommended the following to serve as members of the Grievance Committee: S. R. Miles of Mason City, W. H. Millard of Cherokee and E. P. Messer of Sheldon. They also recommended that the president and secretary be empowered to appoint an assistant secretary, if in their opinion he might be needed. This was for the purpose of securing a canvasser to travel through the State soliciting new members. The report was adopted.

Mr. Swaine also presented a report from the Committee on Resolutions, which was adopted, as follows:

Resolved, That we, the Hardware dealers of Iowa, in convention assembled, reiterate our loyalty to our association and to the National Association, and pledge ourselves to do all in our power to further the objects of both.

Resolved, That we heartily indorse the action of the National Association in trying to persuade the manufacturers and jobbers to refrain from selling to catalogue houses and direct to consumers.

Resolved, That we indorse the action of all manufacturers and jobbers who have pledged themselves to refrain from selling to catalogue houses and consumers.

Resolved, That we tender a vote of thanks to the citizens of Cedar Rapids, especially to the Young Men's Christian Association and the Commercial Club, for their hospitality and courteous treatment during our stay in the city, and to the local and trade papers for their kind consideration.

Resolved, That we are indebted to President McIntire and Secretary Keating for the effective manner in which they have conducted the affairs of the association for the past year.

L. Lindenberg of the Committee on Nomination of Officers reported the following list:

President, W. A. McIntire, Ottumwa.

Vice-President, Jacob Seither, Keokuk.

The report was adopted and the gentlemen named were elected.

The president thanked H. G. Cormick for his presence and assistance, and requested the convention to manifest their concurrence in his sentiments by a rising vote, which was accordingly done. The convention adjourned *sine die*.

The Executive Committee held a meeting on Thursday afternoon and elected President W. A. McIntire and Secretary W. H. Keating as delegates of the Iowa Association to the National Association.

National Retail Hardware Dealers' Association.

The third annual meeting of the National Retail Hardware Dealers' Association will be held on Wednesday and Thursday, March 19 and 20, at the Palmer House, Chicago. All the sessions will be of an executive character. Two delegates from each of the following States, together with some of the State officers, will comprise the gathering: North Dakota, Iowa, Missouri, Arkansas, Illinois, Wisconsin, Indiana, Kentucky, Michigan, Ohio, Pennsylvania, Kansas and Minnesota. We are advised by M. L. Corey, Argos, Ind., secretary of the association, that reduced railroad rates can be obtained by most of the delegates on the certificate plan through the National Association of Merchants and Travelers.

The official manual and directory of the association was issued a short time since. It contains more than 100 pages and presents a variety of matter pertaining to the association, including the aims, objects and resolutions of the organization, constitution and by-laws, portraits of National and State Association officials, directory of State associations and a complete list of the individual members of the National Association in the different States comprising it. The manual does not, of course, reflect the condition of the association at the present time, as some strong State association which have lately affiliated with it are not represented. It is, however, an impressive exhibition of the growth and power of the association movement, and will serve a useful purpose in directing the attention of manufacturers and jobbers, as well as retail merchants themselves (especially those not now members of a State association), to the important influence which such an organization must have on the welfare of the retail hardwaremen of the country.

Death of George B. Miller.

George B. Miller died at his residence in Brooklyn, N. Y., on March 5, of pleuro-pneumonia, after an illness of ten days. Mr. Miller was born in Brooklyn in 1852, and, as a boy, in 1867, was one of the first to be empolyed by U. T. Hungerford, who a short time previously had assumed the management of the New York branch of Wallace & Sons, Ansonia, Conn., manufacturers of brass and copper goods. After serving the house in various minor capacities for several years, Mr. Miller became the city salesman, and in 1877 represented their interests on the road, covering the whole of the United States, from the Atlantic to the Pacific, and from Canada to the Gulf of Mexico. In January, 1892, he went to Chicago to assume charge of Wallace & Sons' lamp department, and remained there until the following year, when he returned to New York to take charge of their lamp department in that city. In June, 1896, when Wallace & Sons went out of business, Mr. Miller became identified with the Bridgeport Brass Company, with whom he remained for two years, when he associated himself with Edward Miller & Co. of Meriden, Conn., and New York, who are well known makers of lamps. After a period of four years in their employ he, on January 1, 1902, began to travel on his own account, representing a number of manufacturers among the wholesale trade, on a commission basis. Mr. Miller was possessed of a genial temperament, and had a host of friends in and out of the trade. He was an industrious and untiring worker and a popular and successful salesman, and was one of the best known traveling men in the brass and copper line. He is survived by a widow and one daughter.

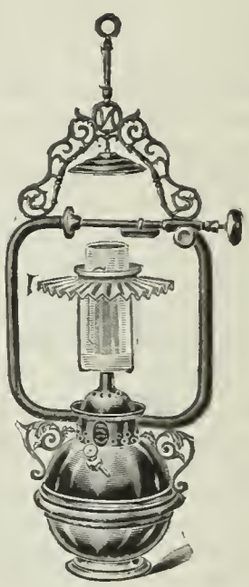
C. Sidney Shepard & Co.'s Fire.

A fire on Wednesday night almost completely destroyed the stock of C. Sidney Shepard & Co., Chicago, with a loss of not less than $100,000. A temporary office has been opened with the Tuttle & Bailey Mfg. Company at 49 Lake street, and all orders for the Chicago trade will be promptly filled from the company's St. Louis house. They expect to return to the same building as soon as the owners can rebuild it, and efforts are being made to have it ready by the latter part of April. Owing to the ample resources of the house it is improbable that their customers will experience any annoyance by reason of the fire and that orders placed with them will be filled with the same high class goods and promptness that have made the concern popular with the trade.

The Nulite Indoor Arc Illuminator.

An illustration is herewith given of a powerful incandescent vapor gas lamp, designed expressly for indoor illumination, which has been brought out by the Chicago Solar Light Company, 132 and 134 Lake street, Chicago. This lamp is rated at 750 candle-power, and the manufacturers claim that it is superior to either electricity or gas and at one-tenth the cost. It is so constructed that it will hang or stand anywhere. The total length of the lamp is 33 inches and the spread of the arms is 12½ inches. It is finished in oxidized copper, lacquered, and has a heavy brass reservoir, having a capacity of 2 quarts, which leaves room for air, it being operated under air pressure. This lamp, it is stated, will burn from 12 to 17 hours.

The generating tube is claimed to be a perfect generator. It is of extra thickness, made of the very best



The Nulite Indoor Arc Illuminator.

seamless brass tubing, retains the heat, and is not affected by cold drafts or cold temperature. The generating stem is made of the best quality of brass rod, accurately turned and fitted. A simple and ready method is provided for removing the generating stem for cleaning, together with an automatic cleaning needle to clean the vapor hole in the tip. A perfect shut off valve, known as the needle valve, is provided at the point of contact between the generating stem and tip, which can be used either to shut off the light entirely or to regulate the flow of gas. The reservoir is made of solid brass of heavy gauge and stands a pressure, laboratory test, of 350 pounds, while only about 30 pounds are required in ordinary use.

Union Furnace Mfg. Company.

Union Furnace Mfg. Company, with main offices at Altoona, Pa., and works at Union Furnace, Pa., have recently established a branch office in the Drexel Building, Fifth and Chestnut streets, Philadelphia. This office is under the personal management of W. C. Moore, a stockholder in the company and one of their organizers. The company are producers of pressed steel specialties, the output of the works including Wolf's pressed steel registers, curry combs, galvanized oil cans, fire shovels, hoes, garden trowels, washers, stove boards, shelf brackets, barrel bolts, coffee mills, &c. A specialty is made, however, of shovels, spades and scoops. The company advise us that they are now in position to furnish solid plain back and riveted shovels in connection with their hollow back shovels, which they have been manufactur-

ing for some time. The capacity of the shovel plant is 150 dozen a day. Mr. Moore is also representing the Monarch Powder Company, an allied concern, who make a specialty of blasting powder for mining purposes. Both plants are operated by electricity, the power being obtained from the Juniata River.

Letter from the Trade.

Defective Goods.

The following communication from a merchant of New York State is in answer to the inquiry of a correspondent whose letter appeared in our last issue:

Referring to your issue of the 1st inst., regarding defective goods, would say the dealer purchasing goods not warranted should be governed by a little good sense, and not make claim for damage, knowing at the time he bought them they were bought at less than market value, and should be willing to stand any loss that might come from them.

Had the customer bought the same article at a Jabberwock or department store he would not have thought of returning it, but because this man is doing a legitimate business thinks to impose upon him. By no manner of means has this man any claim on manufacturer or dealer.

Sterling and American Queen Lemon Squeezers.

The accompanying cuts illustrate two of the 1902 lemon squeezers put on the market by the Logan & Strobridge Iron Company, New Brighton, Pa. The squeezer shown in Fig. 1 is large, and is much stronger than others of the same capacity made by the company.



Fig. 1.—Sterling Lemon Squeezer No. 16.

The arrangement of the pressure bowl and bob is such that the rind of the lemon, when under pressure, spreads instead of curling inward, as is the case, it is remarked, with the ordinary shaped bowl. This arrangement, it is explained, extracts all the juice, whereas the old style allowed some of the juice to remain in the curled up edges of the rind. The manufacturers state that it is



Fig. 2.—American Queen Lemon Squeezer No. 18.

made of the best quality of iron, coated all over with pure tin. In Fig. 2 is shown a squeezer and juice extractor combined. The cup is detachable, and can be used by itself as a juice extractor. By a slight turn of the thumb, after the cup is placed in the frame, it is as securely fastened as if made solid with the frame. It is stated that it is quite as easily and quickly detached for cleaning or for use as an extractor. The frame and handles are finished in japan, while the extractor cup is tinned all over with pure tin.

JOHN T. COCKEY, a son of Joshua F. Cockey, president of the National Bank of Cockeysville, Md., has become a partner in the firm of Timothy Ryan & Co., manufacturers of Tinware, Baltimore, Md.

Stove and Hardware Dealers.

AT a recent meeting of the stockholders of the Witte Hardware Company of St. Louis, Mo., it was decided to increase the capital stock from $150,000 to $300,000, and this has been fully paid in. They will largely increase their facilities in order to better take care of their enlarging business, which they state is gaining at a rapid pace. The company have in preparation a new catalogue, which will contain 1600 pages, being just double the size of the previous ones. It will be ready for distribution shortly.

THE J. W. JORDAN COMPANY of Worcester, Mass., recently incorporated, to deal in Stoves, Ranges and Furnaces, and to do a combination hot air and hot water heating and sanitary plumbing business at 609 to 611 Main street, are the successors of J. W. Jordan & Co., the business of whom was owned by Frederick B. Jordan, who succeeded to it on the retirement of Henry McManus. The firm are one of the oldest in their line in Worcester, having been founded by the late J. W. Jordan half a century ago. The incorporation of the concern has been made with the intention of materially increasing the scope of their business.

THE WILLIAM FRANKFURTH HARDWARE COMPANY, Milwaukee, Wis., have nearly completed a very large new building on West Water street in the jobbing center of the city, into which they will shortly move their large stock of goods. The new structure is 150 x 150 feet square, and is of three stories with basement. The firm handle a large line of Shelf Hardware, Tin Plate and Metals, Tools, &c.

THE TRENTON LAMP & MFG. COMPANY, Trenton, N. J., have been incorporated with a capital of $150,000 by A. Fondeville, H. Van Iderstine and Charles Womwell to manufacture Lamps, &c.

THE ANSCHUTZ MFG. COMPANY of Franklin, Ind., have been incorporated with a capital of $10,000 to manufacture Dust Pans. The directors are Mary E. Anschutz, Frank D. P. Anschutz, John T. Adams and Claude E. Lee.

ED. C. WHITLOCK has purchased a stock of Hardware at Kinross, Iowa, and will also handle Stoves, Bicycles, Pumps, &c., operating a tin shop for roofing and general repairing. He desires catalogues and price-lists.

FIRE recently destroyed the store of the Clayton Hardware Company, Goldfield, Col. The insurance of nearly $6000 covered the loss. The company will rebuild with a brick structure, 50 x 125 feet in dimensions, two stories high. Their line embraces Shelf and Heavy Hardware, Stoves, Tinware, Sporting Goods and Miners' Supplies. They have discontinued their Denver store.

THE partnership in the Hardware Stove and Plumbing business in Troy, Ohio, formerly existing between Mary J. Hayner and H. A. Cosley, under the firm name of Harter & Cosley, has been dissolved. Mary J. Hayner has sold her interest to Mr. Cosley, who will continue the business under his own name. This business was established by S. K. Harter 57 years ago, and Mr. Cosley has been identified with it for the past 30 years.

THE GURNEY REFRIGERATOR COMPANY of Milwaukee, Wis., are reported to have recently secured a contract calling for the shipment of some 120 Refrigerators of various sizes to Honolulu, Hawaiian Islands.

THE Board of Trade of Middletown, Conn., according to a local report, are negotiating with Louis Haberman, formerly superintendent of the Eastern Tinware Company at Portland, with regard to locating a plant in Middletown.

HENRY D. HEDGES will open a new Hardware and House Furnishing Goods store in the Grimshaw Block, East Hampton, N. Y., on April 1.

THE BENBOW-BRAMMER MFG. COMPANY, manufacturers of Washing Machines, at 5215 McKissock avenue, St. Louis, Mo., suffered a loss of between $30,000 and $40,000 by fire last week. The loss is partially covered by insurance.

House Gas Piping.*

BY C. S. GRISWOLD.

In the spring of 1899 we put in execution a plan we had for the piping of houses situated along the line of our main in which gas had never been used for lighting. The introduction of gas stoves, with one light over the stove, has caused the people to inquire the cost of piping their houses, but in many instances the expense was so great it seemed to them exorbitant. These houses were in most cases owned and occupied by mechanics whose only income was their daily pay. After conferring with the local gas fitters we established a price for both concealed and exposed piping, with fixtures and globes complete, ready to light, with stove connection (where one was not already in), for $11 and $15 respectively for four rooms, every additional room being $2 extra. We also gave a price without fixtures. We contracted with a local firm who manufacture gas fixtures to supply what was needed. They designed one especially for us. We carry but two styles and prices of fixtures.

During that year we piped 128 houses, the local fitters doing most of the work, at $2.50 an opening, concealed piping. This was done without any canvassing other than the distribution of circulars and newspaper advertising.

At the close of the season the gas fitters thought there was not money enough in it for them, as the price of pipe had advanced. We therefore concluded to do our own piping, employing the men who had been setting stoves for that purpose. The plan of doing our own work gave better satisfaction, both to the consumer and to the company, more especially to the consumer, for in many instances one might wish a slight change from the original order, which can be made by the company at a nominal cost; and it more than pays, for it pleases a customer. In all cases trying to please a customer pays, for it brings new business and is a cheap way to advertise. To do this no large outlay is necessary, but careful attention to smaller details will usually accomplish it.

During the year 1900 we continued the same plan, but raised the price to $13 for our A grade and $18 for our B grade of fixtures for four rooms. That year we piped 142 houses and also furnished quite a number of fixtures to houses already piped.

In 1901 we changed the style of fixtures, but only carried two styles and prices as before. For the year we have piped 109 houses.

The houses piped are usually from five to ten rooms. Only the very best black pipe is used and galvanized fittings. Our fitters are of the best, and some of them have been in our employ five years. Some who came to us as helpers are the best fitters we now have. They have been taught to think and work quickly, to use as little pipe and as few fittings as practicable, and have the work well done. In my experience as inspector of gas piping I find that gas fitters in general use too much gas pipe and too many fittings. Another difference between our fitters and regular plumbers is in the use of fittings. They use L's where they can; we use T's, for the reason if changes were to be made they could be accomplished more easily and much cheaper than when a line has to be cut to insert a T. Another advantage is, if from any cause there is a stoppage in the pipe you can more readily and with less expense remove the obstruction.

The sizes of pipe are mostly ¾-inch, ½-inch, ⅜-inch. Risers are never less than ¾-inch; stove pipe, ¾-inch; house runs, usually ¾-inch; if not very long, ½-inch; never but one opening off ⅜-inch. The reason galvanized fittings are used is there is less liability for sand holes than with black fittings.

The fitters must be courteous, quiet, quick and neat; quiet about the house, quick to think and work, and neat about their work. One who is used to piping will always try to get his riser so that he can extend from it with as few angles and as few cuts in the floor as possible. Of course some houses are harder to pipe than others. Those with double floors, or floors deadened with cement (our price is $3 extra for such), make a slight difference, but less than many would think. Gas pipe is small and takes up but little room.

Some people have said, "I should think the local plumbers would be down on you." Not necessarily; they could not get this work, or very little of it, for they cannot afford to do it as cheap as the gas company, and as the gas company does not do any new work there is no conflict between us. We are on the best of terms.

The net loss per installation, when plumbers were doing the piping, was $6, but now that our men do the work and have become more experienced the loss is practically nothing.

This year we expect to introduce a new plan. We will set a stove, with one light over it as usual, and pipe (exposed piping) for two additional lights, either side bracket or single pendant, at an estimated cost to us of $15. To collect this amount we propose to set the slot meter at a sufficient advance to enable us to get returns in five years, at which time the outfit belongs to the consumer. This will give us the opportunity of reaching a class of customers never before obtained.

* Paper read at the thirty-second meeting of the New England Association of Gas Engineers.

Change In New York Plumbing Ordinance.

For some time a special type of fresh air inlet guard has been required in Brooklyn, but through the efforts of the Master Plumbers' Association the ordinance has been amended so that the use of the patented device is no longer mandatory, and Section 79 now reads as follows:

Section 79. A fresh air inlet must be connected with the house drain just inside of the house trap. Where underground it will be of extra heavy cast iron. It must extend to the outer air, and finish with a return bend, at least 1 foot above the grade and 10 feet away from any window or cold air box. An automatic device approved by the Superintendent of Buildings may be used when set in a manner satisfactory to the said Superintendent.

The amendment was adopted about the middle of last month by the building superintendents of the five boroughs.

License Required to Disconnect Boiler?

The advisability of having the house drainage system protected by suitable regulations and constructed or altered only by plumbers who have shown their competency and taken out a license has been demonstrated. But when there is an endeavor to prevent any workman from disconnecting a kitchen boiler or connecting it with a range the object is open to reasonable question. Similar efforts to reserve this class of work to licensed plumbers have been made in the past, and some interest will be taken in the result of a request made by a citizen of Washington to the commissioners of the District of Columbia to give a decision on this point. The following on the subject is from the Washington *Star:*

The District Commissioners recently received a letter from Walter J. Wheatley, requesting a ruling as to the status of steam and hot water pipe fitters in regard to plumbing work, and especially in regard to certain work done by Peter J. May. O. L. Ingalls, the Inspector of Plumbing, has reported to the Commissioners that the inquiry originated in the removal of a hot water kitchen boiler, used for domestic purposes, from an upper floor to the basement of premises 2100 Fourth street, northeast. The water pipe connections to this boiler were made, it is alleged, by Mr. May, an unlicensed plumber, who, in Mr. Ingalls' opinion, clearly violated the plumbing regulations, and, he says, Mr. May would have been prosecuted had it not been for lack of evidence as to date and other details.

Mr. Ingalls says that the work done was clearly that of plumbing and should have been performed by a registered plumber or his employee, as provided for in the act of Congress approved June 18, 1898. He says further that in all new houses the plumber provides a connection at a convenient place, controlled by a valve or stop cock, for the service of hot water boilers, and he says that no objection has been made to a steam fitter connecting the boiler at the point designated. When no such provision exists, then Mr. Ingalls thinks that it is clearly the right of no one but a registered plumber or his employees to make the requisite connections.

The Metal Worker acknowledges the receipt of a copy of the "Proceedings" of the fourth annual convention of the northern and southern jurisdictions of the California Master Plumbers' Association, and of the convention consolidating the two jurisdictions into the California State Association of Master Plumbers. The "Proceedings" not only gives an account of the convention, but also contains the constitution and by-laws, the rules and the Cleveland Resolutions. It also contains a report of the State executive conference, which indorsed the action of the National Executive Committee in regard to the repeal of the New York Conference Resolutions and the substitution of the Cleveland Resolutions.

European Radiators.

BY CHARLES F. HAUSS.

The manufacture of radiators in Europe—that is, what the heating trade of America term radiators—is practically a new industry, and one that has made wonderfully rapid strides in the past three years. Some of the plants in Germany, Austria and Russia, as well as some in England, have American machinery and tools, and the later productions compare favorably with radiators made in America, the greatest difference being in weight.

The style of radiation most made and used in Europe is shown in Fig. 1. It is made in lengths of 6 feet 6 inches usually, but is also furnished in any shorter or longer special length desired. The number of flanges, or gills, on this gill pipe vary so that on two sections, each 6 feet 6 inches long and 2½ inches inside diameter, the one has 68 gills 6½ inches in diameter and contains 28 square feet of surface, while the other has 95 gills 7½ inches in diameter and has 54 square feet of surface. With the fitting shown in Figs. 2 to 11 any style or size of radiator can be made up. For residences they are covered with wood or ornamental iron casings. Figs. 12 and 13 show the gill pipe radiator used in channel heating for church aisles, where the radiating surface is placed under the floors.

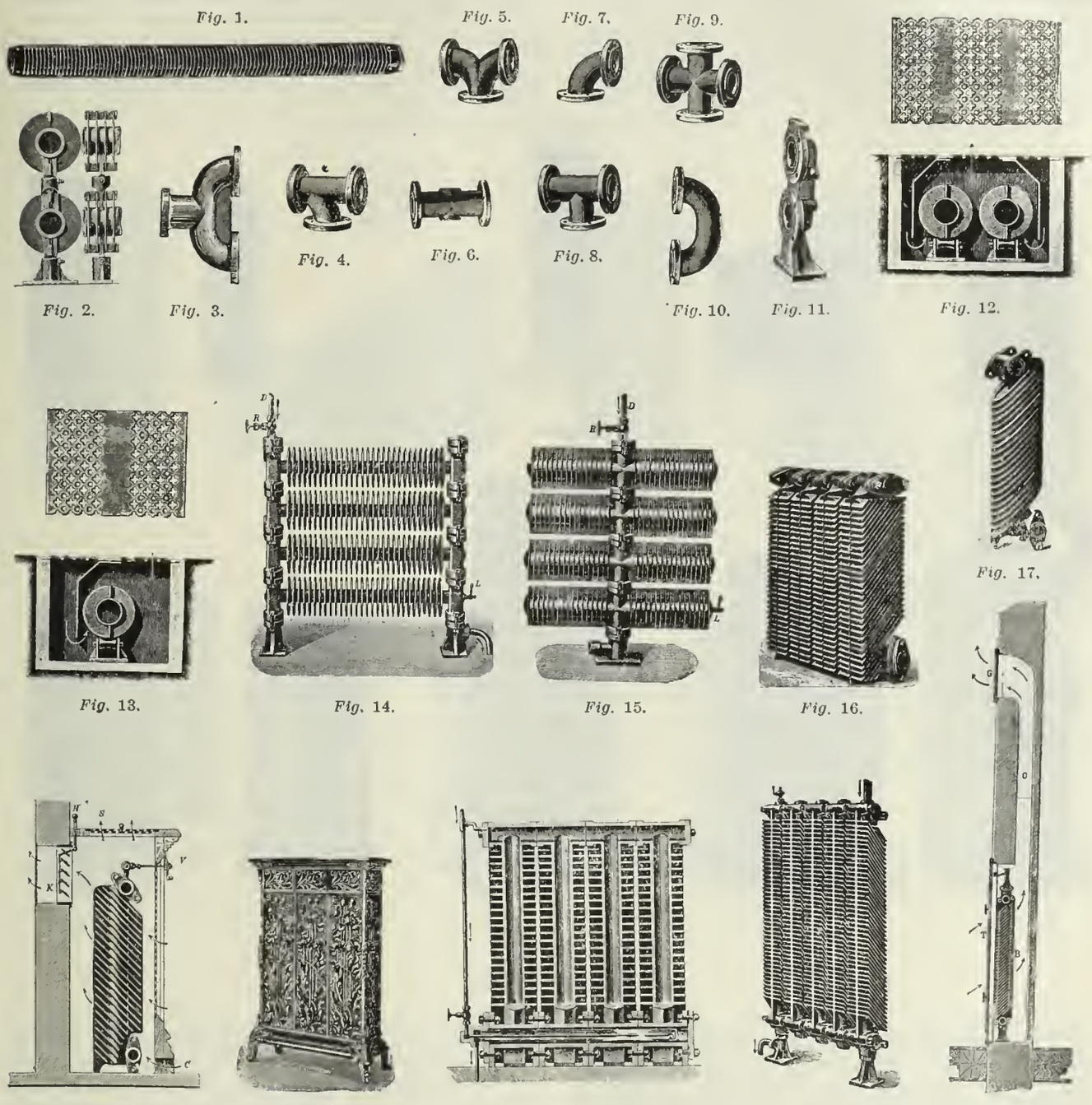
In Figs. 14 and 15 are presented other styles of extended surface radiation, made in various lengths, while Figs. 16 and 17 show a box radiator, with square or oval gills, set at an angle, Fig. 18 illustrating how this style of radiator is cased.

Fig. 19 is a radiator made in ornamental slabs, with ribs at the back, giving a large amount of surface. The fronts, being enameled or bronzed, give it a very ornamental appearance. Any number of these slabs can be set together.

Fig. 20 gives a steam-hot water radiator, one that is filled with water which is heated by steam in a welded end tube in the base. Fig. 21 is a narrow recess radiator, used as shown in Fig. 22.

Figs. 23 and 24 represent a box radiator connected horizontally, and in Fig. 25 is shown one connected vertically. In Figs. 26 to 29 is shown what is known as the Star radiator, and Figs. 30 and 31 are illustrations of a very large circular radiator.

A pipe radiator, shown in Fig. 32, is made of wrought iron tubes expanded into cast iron bases and tops. This style of radiator is made mostly with an inner and outer tube, the air passing through the inner tube and the



EUROPEAN RADIATORS.

water or steam circulating between the two tubes. This type of radiator is made in many forms and sizes, square and round, long and short, and is used principally for schoolhouse heating.

Figs. 33 to 40 show the first efforts made in casting radiators on what was termed the American system, and Figs. 41 to 46 the later efforts in the same field. These radiators are really well made, are nearly as light as American radiators, and are connected with either slip nipple or screw nipple joints, as desired. They are made in all the usual hights, both plain and ornamental. In most cases the sections are set 3 to 3¼ inches, center to center, to facilitate cleaning them.

A novelty for which big claims are made is shown in Fig. 47. It is a tile radiator made in Zurich, Switzerland, and is used for steam and hot water heating. The

The P. and S. S. League.

To correctly award the prizes in the bowling tournament of the Plumbing and Steam Supply League of New York City no little figuring was necessary on the part of Secretary Wilson, and the names of the winners in some instances were not obtainable when our report was given in *The Metal Worker* of March 1. The report, however, was substantially correct. C. W. Grimshaw of the Crane Company team made an average of 174 and won the first average prize, but elected to take instead the gold mounted pearl opera glasses presented by W. S. Emery for the smallest percentage of breaks, having made but 2.38 breaks per game in 14 games. This changed the list of winners of individual prizes and gives first place to J. S. Dibley of the Central Foun-

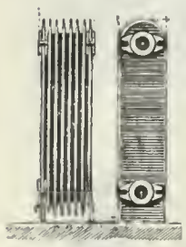


Fig. 23.

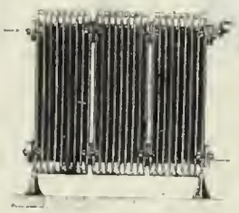


Fig. 24.

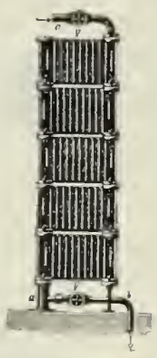


Fig. 25.

Fig. 26.



Fig. 27.



Fig. 28.



Fig. 29.



Fig. 30.



Fig. 32.



Fig. 31.

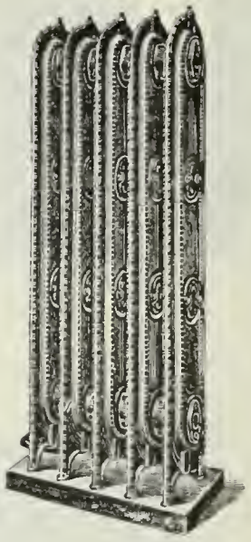


Fig. 33.

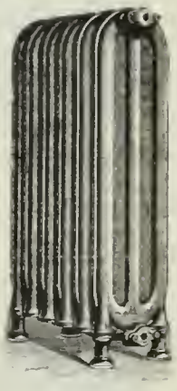


Fig. 34.



Fig. 35.

EUROPEAN RADIATORS.

universal popularity of the old tile stove in Europe, owing to the mild, even heat it gives off, and the objection to steam heat on the score of its intensity, and the fact that under the best conditions it is intermittent, prompted the inventor to take a pipe radiator and cover it with tile. A steam radiator of this type gives off the heat much like a hot water radiator. It is slower in getting warm, never is so intensely hot as to burn the dust and give off the consequent bad odor, and when shut off it gives off the stored heat gradually; hence it is good for spring and fall heating, when the radiator can be heated and then shut off to cool slowly, the same as a hot water radiator, without running the risk, ever present in hot water heating, of freezing or flooding. For hospitals or schools its smooth outer surface commends it for sanitary reasons, and where an ornamental radiator is wanted it admits of the most elaborate decoration. Its cost is said to be about the same as that of cast iron radiation.

A MEETING of the Central Board of the National Association of Master Plumbers of England was held at Nottingham on February 28.

dry Company team, with an average of 171 11-14; the second place to Rollin C. Wilson of the Salesmen team, with an average of 171 10-13, and the third place to A. E. Good of the Crane Company team, with an average of 164 1-14. It will be seen that the difference in average between Mr. Dibley and Mr. Wilson is but a very small fraction of a pin, or 1-384. E. E. Haff made 67 spares in 14 games and secured the prize for the greatest number of spares. The diamond cuff buttons, donated by the *Plumber and Fitter* for the greatest improvement, were won by R. J. Pearson of the C. S. Locke & Smith team, he having made an average of 118 in his first seven games and 151 3-7 in the last seven games, showing an improvement in the average of 33 3-7 pins.

Arrangements have now been completed for a dinner to be given at the Drug Trade Club, 100 William street, on Saturday, March 22, at 6.30 p.m., when the prizes will be awarded to the different winners by prominent members of the trade. Tickets for the dinner will not be restricted to members of the teams, as the desire is to make it a social event in the trade. Any one connected with the plumbing and steam supply trade can procure a ticket for $1 from Secretary Rollin C. Wilson, 116 Nassau

street, New York, if sufficient notice is given to enable arrangements to be made for proper service.

Captain Emery had his best team out in the Business Championship Tournament last night. C. G. Beach of the Central Foundry Company team has been elected captain to select the team to bowl a series of friendly games with the team composed of members of the plumbing supply trade in Boston, Mass., three games to be bowled in Boston and three in New York. Mr. Beach is now in correspondence with Oscar Saxe of the Dalton-Ingersoll Company of Boston, and as soon as his arrangements are completed announcement will be made of the dates on which these contests will take place.

Death of A. T. Henderson.

The heating trade will learn with regret of the death of A. T. Henderson, which occurred on Friday, March 7, at his home in Reading, Pa., after a brief illness from Bright's disease, attended with much suffering. Mr. Henderson was born in Collingwood, Ontario, 43 years ago. During his early life he was connected with a number of manufacturing supply houses in Windsor, Canada, and Detroit, Mich. In 1887 he was made the manager of the Detroit Heating & Lighting Company, which office he left in 1892 to take an active part in the United States Heater Company. On the organization of the Prizer-Painter Stove & Heater Company of Reading, Pa., in 1899 he became a director of that company, of which he was the secretary at the time of his death. Mr. Henderson was not only well acquainted with the trade in Detroit, but had traveled a great deal and had spent several years in Chicago, and later in New York. He thus had an opportunity of establishing friendships in these different centers of the heating trade, in which he was held in high esteem. His knowledge of the business enabled him to design a number of steam and hot water heating boilers, which are still upon the market, reflecting credit on his ability and judgment. His funeral took place on Tuesday and was attended by many friends. He is survived by a wife and one daughter.

Deming Pumps.

The Deming Pump Company, Salem, Ohio, are now issuing to the trade their 1902 catalogue, No. 21, devoted to pumps and hydraulic machinery. It consists of 294 pages, bound in flexible cloth cover. The introduction calls attention to the quality and design of the Deming pumps, also to the company's telegraphic code, classification of pumps, alphabetical index and rules and tables for use of pump men and hydraulic engineers. It also states that for the convenience of dealers and users they print a special catalogue devoted to Triplex deep well and power pumps, and one relating to spray pumps and nozzles. The first section of Catalogue 21 is devoted to ordinary lift and pitcher pumps, followed by antifreezing pumps and pumps adapted to operation by means of a hand lever or wind mill power. These are followed by a variety of force and lift pumps of both single and double action type. The next section refers to the company's specialties, such as stuffing box heads, deep well working heads, cylinders, working barrels, artesian well valves and cylinders. Strainers, foot valves, tank and float valves, air chambers, pump leathers, wind mill connecting rods and regulators and drive well points occupy another section of the book. These are followed by a variety of double acting lift and force pumps adapted for various purposes. Power pumps, hand boiler feed pumps, steam pumps and pumps designed to be operated by horse-power are followed by double acting Triplex pumps and pumps for heavy duty, and these by spraying apparatus and the Deming hydraulic ram. The concluding pages present street hydrants, kitchen sinks, a variety of brass goods, tools and supplies, several pages at the end being devoted to the prices of different pump repairs.

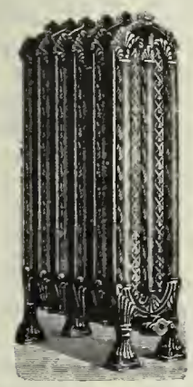


Fig. 36.

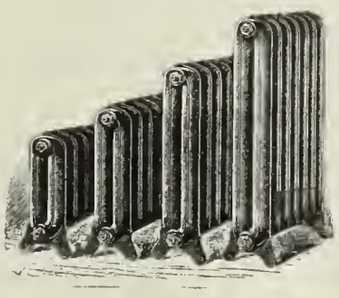


Fig. 37.



Fig. 38.



Fig. 39.



Fig. 40.



Fig. 41.



Fig. 42.



Fig. 43.



Fig. 44.



Fig. 45.

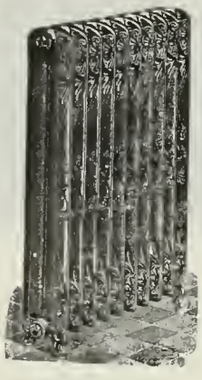


Fig. 46.



Fig. 47.

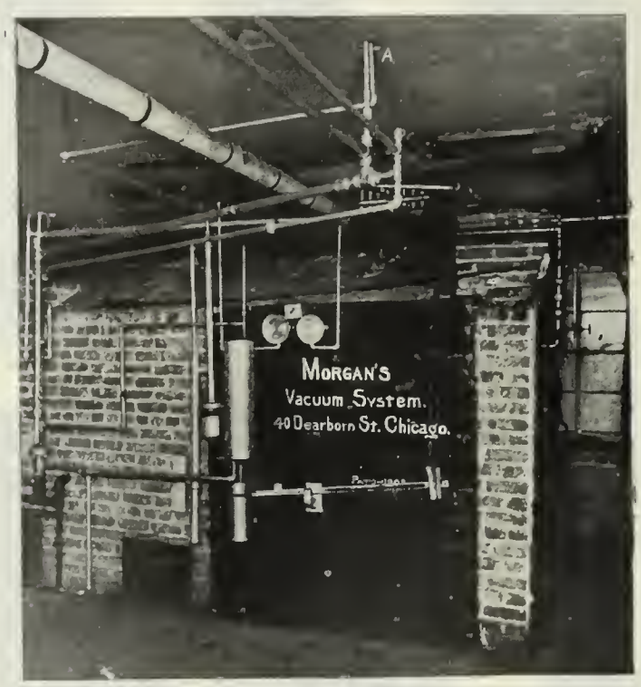
EUROPEAN RADIATORS.

NEWPORT, R. I., has adopted a new ordinance requiring the examination and licensing of plumbers, and the formulation, in connection with the Board of Health, of new rules and regulations relating to drainage and plumbing. A penalty is also provided for those who violate the ordinance.

The Morgan Vacuum Steam Heating System.

The excellent results attending the equipment of a large apartment house by Morgan & Co., 40 Dearborn street, Chicago, with the Morgan vacuum system will lend interest to the following description of the building and what was accomplished in it:

The building has a frontage of 50 feet and a depth of about 100 feet. It is five stories high and contains 11 flats, besides the apartments occupied by the owner, which in space are the equivalent of three flats. There are also two flats at the front of the first story, boiler room and laundry occupying the space of one flat in the rear. The building contains 71 radiators and five coils, about 2500 square feet of surface in addition to mains and risers, which are not covered. There is also connected to the heating boiler a 300-gallon tank, from which is furnished hot water for domestic purposes. The heating plant in the building was first fired on December 7, but as it was in an incomplete state some allowance must be made to arrive at a fair comparison as to the relative economy of the apparatus with and without the vacuum system, though relative attention required and duration of heat may be fairly compared.



The Morgan Vacuum Steam Heating System.

The boiler is a multitubular with smoke burning attachment, and as a smoke burner is very successful. The smoke burning attachment consists of coking ovens, one on each side of center grate, grate of ovens having a sharp pitch toward center grate, the fuel after coking being raked over to center grate. The gases from the coking coal pass to back of boiler in brick flues and are returned to front, passing up through center grate, also through incandescent coals thereuon, and are practically consumed, there being very little, if any, smoke showing at top of chimney. The fuel used is Illinois soft coal, run of mine grade.

Before attachment of the Morgan vacuum system it was necessary to fire the boiler every two hours, from 5.30 a.m. until 9.30 p.m., heat being maintained not to exceed one-fourth of the time during these hours and not at all at night. Under these conditions there was consumed during the month from December 7 to January 7 34 tons of coal. The Morgan vacuum system was attached on January 9, and, though not entirely completed, was immediately successful in maintaining constant heat both day and night, the consumption of fuel for the ensuing month until February 9 being 27 tons. The fuel consumption from February 9 shows a very marked decrease, though the exact amount cannot be determined before the entire carload of coal has been used, as all weights mentioned were taken from the bills of the coal dealer.

It has proved to the satisfaction of the owner that with the Morgan vacuum steam heating system the amount of fuel used is governed by the external temperature and, further, that the attention required is correspondingly reduced, as in this plant, in the most severe weather, it was only necessary to fire five times a day in addition to raking the coke to the center grate twice, whereas before the vacuum system was attached nine times was the minimum, though it is probable that with the ordinary steam boiler using hard coal firing once in 24 hours would be sufficient.

In this heating plant, with the exception of one cluster of four radiators, each radiator has a separate air pipe extending to the basement, where it is attached to the main air pipe, which is 1-inch, running side by side with the main. The 1-inch pipe starts at the end of the return pipe, which is connected to the main air pipe through a mercury trap, this being the high end of the air pipe, which from this point pitches to the boiler. At the boiler the air and water of condensation are separated by a loop, the air passing up and over the loop and then down to the main mercury trap, the water passing to the boiler through the return, as shown in the cut herewith. In this manner all escape of water or steam into boiler room is entirely overcome. The damper regulator is attached to return pipe below water line, so that circulation takes place through coil in tank, in this way governing the action of the regulator by the temperature of the water in the boiler.

In practice it has been found unnecessary to run a separate air line from each radiator with the Morgan, but as many radiators can be connected to one pipe as is convenient. It has also been found, the company state, that while an absolutely tight job will give the best results, a job that has many perceptible leaks will be greatly benefited by the vacuum system. A steam plant as tight as a hot water plant will yield, with the vacuum system, the same temperatures and with very much less fuel than the hot water plant, the expense of construction being materially less.

A B C Steel Plate Fans.

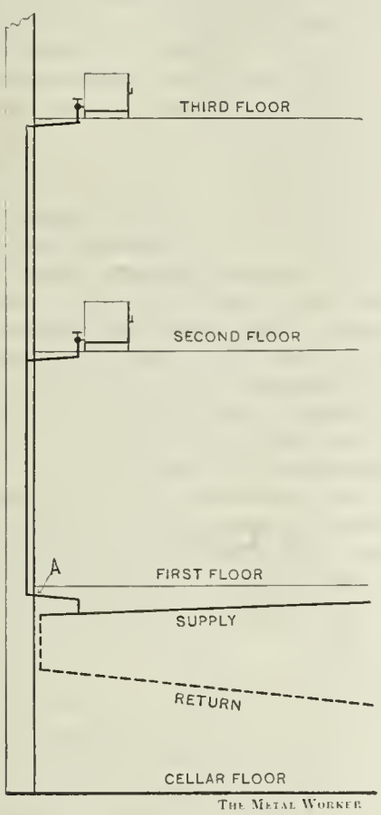
The American Blower Company, Detroit, Mich., with New York office at 141 Broadway, are sending out their illustrated sectional catalogue No. 134, devoted to the A B C steel plate fans for heating, ventilating and drying plants, forced and induced draft apparatus. The introduction calls attention to the increasing popularity of the fan system of heating and to the success of the company in keeping abreast of the demands of the trade in producing fans adapted to their requirements. The catalogue shows a great variety of fans of all sizes, full and three-quarter housed, adapted for cooling a large quantity of air; some with engines directly attached and some to be electrically driven. Views are also given of the fans removed from their business, so that the general construction may be readily understood. Engravings also show the construction of the journal boxes. The catalogue contains a large number of tables giving the dimensions of the fans, and also their capacities, besides a variety of useful information on fan work. The last portion of the catalogue is devoted to exhaust fans and the A B C hot blast apparatus complete with fan, heater and main delivery duct, such as is used in modern buildings for heating and drying material. The catalogue is accompanied with a circular relating to the Morehead return trap, which is especially designed for use in connection with heaters of hot blast systems.

The Metal Worker acknowledges the receipt from Secretary A. P. Elder of a copy of the "Proceedings" of the seventh annual meeting of the Kansas Master Plumbers' Association, held at Topeka, Kan., on January 20. In addition to the report of the convention the pamphlet contains two interesting papers, one on "Sewers and Their Construction," by W. R. Goit of the W. S. Dickey Clay Mfg. Company, and the other on "Business Methods of the Plumber," by I. Bishop. These papers are followed by a list of the members of the association.

COLD WALL STOPS STEAM CIRCULATION.

BY ACE.

That the results obtained at radiators are very often attributed to conditions for which they are in no way responsible was demonstrated when testing a heating apparatus during a recent cold spell. After starting a fire for the first time in a one-pipe steam job in a new building, circulation was established in all but the two radiators shown in the sketch herewith. The supply to these radiators is taken from the top of the main, as shown, the riser being concealed in an exposed brick wall, running parallel with and touching a terra cotta smoke flue, which is open top and bottom, but not in use. With 3 pounds pressure at the boiler the two radiators would not circulate, although the supply branch in the cellar was hot at A, where it entered the wall. The automatic air valve was disconnected at the second-floor radiator and examined, and there was no indication of steam or water at the vent opening in the radiator; the radiator was disconnected at the valve and the valve



Cold Wall Stops Steam Circulation.

examined with the same results. This located the trouble between the point A and the second-floor radiator, the natural conclusion being that the riser was stopped up, for during these examinations 3 pounds pressure was maintained at the boiler. After reducing the pressure to zero the elbow at the top of the main in the cellar was broken, the branch from the riser to the second-floor radiator was taken out and pieces of putty about 1 inch in diameter were dropped through the riser from the second floor to the cellar, which proved that the riser was clear. Theories were resorted to, but, with all due respect to theories, none seemed to explain why the radiator did not circulate, and the following experiments were made, which located the cause and corrected the trouble.

All the connections were replaced, and with 6 pounds pressure at the boiler water was discharged at the air valve of the second-floor radiator, which proved that although the pipes were clear and the valve open the condensation between A and the second-floor radiator was so great that the steam delivered to the riser was condensed and held in suspension. A drip pipe between the bottom of the riser and the return main was suggested but not used, as the object was to reduce the excessive condensation and not provide for it. This was accomplished by resting the bottom of the riser on a block of wood in place of the stone wall and placing strips of wood between the riser and the wall at every point where they came in contact with each other. The bottom of the idle smoke flue was closed to stop the cold draft, but as this flue will be used for the kitchen range it was not thought advisable to place wood between it and the steam risers. When this flue is in use it will assist in warming the wall and reducing condensation in the riser.

Many readers may be of the opinion that the excessive condensation in the riser was due to other conditions than those stated, but no other changes or additions were made and the two radiators are now circulating with no indicated pressure at the boiler, which fact I believe to be the proof of the pudding. While it is generally understood that it is not good practice to allow heat conductors to come in contact with conducting materials of a lower temperature, the great detriment to the success of the apparatus is seldom fully appreciated until after an experience, which is often very costly and troublesome. When compelled to place heat risers in exposed walls it is good practice to line the recess with wood or asbestos cardboard.

New York City Notes.

The Examining Board of Plumbers has about the same number of applicants each month, the average being about 25 from all boroughs.

* * *

C. D. McClure of 144th street, Bronx, has the plumbing of a large apartment house at Broadway and 111th street.

* * *

The Tracy Plumbing Company are busy with plumbing the club house and buildings of the new Jamaica race track, and will shortly start the plumbing in the subway station at Fifty-ninth street and Broadway.

* * *

Samuel Lyttle of West 118th street has two good jobs well under way in a large eight-story apartment, 75 x 100 feet, at the corner of Madison avenue and Ninety-ninth street, and eight seven-story apartments on Ninety-first street between Lexington and Third avenues.

* * *

Henry Steinert, who has been counsel to the Board of Health for many years, lately resigned at the instance of the Corporation Counsel, who stated that as much of the legal work of the Board of Health would be transferred to the Tenement House Board, his services were not needed. By the resignation of Mr. Steinert the plumbers have lost a good friend, one who was always ready to take action against a nuisance or help a deserving plumber out of a difficulty.

* * *

The Tenement House Law has been amended as regards Brooklyn, allowing three-story tenements to be put up there without all the restrictions imposed in Manhattan. There is no doubt that this will encourage building in Brooklyn at the expense of Manhattan, although the class of houses that are likely to be put up are such as Manhattan can afford to dispense with.

* * *

The rival central bodies of the building trades have finally come together under the name of the United Board of Building Trades of New York and Vicinity. The first thing they did on uniting was to order all rival trades unions to cease fighting. This includes the plumbers, which trade will decide on March 16 as to what form they will be governed under.

THE new price-list of the Richmond Heaters, manufactured by the Richmond Stove Company, Norwich, Conn., which took effect February 18, 1902, will be a convenience to all who contract for steam and hot water heating systems. It gives, in addition to prices, many useful dimensions of the company's vertical sectional and round Steam and Hot Water Heaters, also small Tank Heaters and Laundry Water Heaters.

ASSOCIATION NEWS.

New York State Plumbers.

The fourteenth annual convention of the New York State Association of Master Plumbers was held at Elmira, N. Y., on Tuesday and Wednesday, March 11 and 12, with a large attendance. After considerable discussion the Cleveland Resolutions were indorsed. The old officers were re-elected, as follows:

President, Charles B. Huck, Buffalo.
Vice-President, B. F. Donahoe, New York.
Secretary, H. J. Wood, Buffalo.
Treasurer, A. H. Brown, New York.
Executive Committee: Horace F. Westcott, Albany, and the officers.

A banquet was given the visiting delegates by the Elmira Association under the management of a committee composed of Robert H. Walker, John T. Sadler and George W. Krowl.

Jersey City Master Plumbers.

A meeting of the Master Plumbers' Association of Jersey City, N. J., was held at Groeschel's Hall on Thursday evening, March 6, with a large attendance of members, when the following officers were elected for the ensuing year:

President, A. Becker.
First Vice-President, J. A. Joans.
Second Vice-President, W. H. Stone.
Third Vice-President, C. Sulk.
Recording and Financial Secretary, M. P. Moran.
Treasurer, W. J. Cross.
Sergeant-at-Arms, T. Heatherton.
Trustees: T. Heatherton, J. A. Joans, C. Sulk.
Committee on Licenses: T. Heatherton, J. A. Joans, J. Sprouls, A. Werner, G. Knoll.

A Trip Through a Sewer.

A very remarkable experience came to Edward Boyle, a plumber's helper in the employ of George Bradischer of 2 Goerck street, New York City, on Thursday. He was working at the removal of a stoppage in a house drain from the main sewer on East Fifty-third street, when a heavy shower in another section sent a rush of water through the sewer, which is said to have a pitch of 30 degrees at this point. Two men who were working with Boyle came out of the sewer, but he went back to strengthen the staging from which they had been working with a life line attached to him. The latter broke and the life line became detached and Boyle was swept swiftly along the murky stream, but not without friction in turning corners, according to his story, until, with germs, microbes and other miscellaneous refuse, he was shot from a maelstrom of darkness into a Niagara Falls of light in the East River. He was taken on the barge "Fleming" by Capt. Otto Lauritzen, who turned him over to an ambulance sent by the police to the mouth of the sewer at Forty-ninth street. Boyle suffered no material damage, and after a bath and a change rode back to the shop in his employer's wagon. He says he had to swim for it, and received from the patrons of the sewer many stale bouquets and similar doubtful compliments *en route*, so that he has no desire to repeat the trip.

The Oberle Pipe Support Fittings.

Some new fittings that will be interesting alike to plumbers and steam fitters who have to provide support for heavy drain and steam mains have been put on the market by J. F. Oberle, 780 Second avenue, New York City. They consist of a substantial cast iron base drilled and tapped for wrought iron pipe of suitable size for supporting a heavy weight. It has a broad, square bottom, and the pipe socket is reinforced. The rest for the upper end of the pipe standard is made for different uses. One is adapted to the use of cast iron soil pipe, and has the regulation ¼-inch pitch, so that a soil pipe that runs above a cellar bottom can be firmly supported and the wrought iron standards cut so as to suit the fitting and preserve the pitch. Another style of rest is adapted to the large horizontal hot water storage tanks used for supplying apartment houses with hot water. These rests fit the curve of the tank, support it securely and save labor and expense for the plumber. Another style of rest is adapted for supporting vertical tanks, having a curve to fit the shell of the tank at the bottom. These will be found a great convenience. Circulars giving full explanation and showing the fittings and all their applications will be sent to those who desire them.

Heating and Plumbing Notes.

We have received from President E. D. Hornbrook of the National Association of Master Plumbers, a copy of the official directory of recognized master plumbers in localities where there are members of the National Association of Master Plumbers, issued under date of March 1. The directory consists of 170 pages and, in addition to giving a list of members, also includes the names of many who are not members of the association, these latter being designated by means of an asterisk.

B. J. Lambert, city clerk of Merrill, Wis., will receive bids until March 20 for heating, ventilating, plumbing and sewerage systems for the new High School Building at that place.

Inferior plumbing is alleged by the City Plumbing Inspection Department of Denver, Col., to be increasing throughout the city. Ordinances prescribe certain conditions within which all plumbing must come. The inspectors have reported that much inferior work has been condemned within the last month, causing considerable extra expense to the citizens who had paid for the work, supposing it to be first class. The department chiefs say that all competent plumbers have certificates from the city plumbing examiners and that these should be demanded by master plumbers.

The Metal Worker acknowledges the receipt of an invitation from President E. E. Hoff of the Plumbing and Steam Supply League not only to attend the first annual dinner of the League, but also to present one of the prizes to the winners. The dinner, which is to be given at the Drug Trade Club, 100 William street, New York, on March 22, at 6.30 p. m., will be quite a social event in the trade.

Tucker & Co. of Boston, Mass., have opened a branch of their plumbing business on Front street, in Marblehead, under the management of Robert J. Cleary.

The new Cast Iron Pipe foundry at Gadsden, Ala., which was started upon the removal from that town of the plant of the Central Foundry Company, is progressing toward completion and will be in operation before the end of this month.

Father Broens, pastor of St. Ignatius' parish, Toledo, Ohio, has awarded the heating of the new church to F. J. Wilhelm of that city. The heating of the parish house has been awarded to the Toledo Heating & Plumbing Company. The wiring of the church and residence goes to the Fisher Electrical Company and the plumbing contract has been awarded to Schelling & Forrest.

James A. McCabe, who has carried on a plumbing business at Ware, Mass., for a number of years, has closed his shop and taken a position as foreman in a shop at Marlboro.

James C. Smith, chairman of the School Board of Meadville, Pa., will receive bids until March 22 for a system of plumbing for the Second District School in that town.

The N. O. Nelson Mfg. Company of St. Louis, Mo., are said to be contemplating the opening of a branch house in Des Moines, Iowa.

Blum & Eyster, 30 North Beaver street, York, Pa., have the contract for the plumbing, cornice, sheet iron and tin work on the York Opera House.

William L. Quinnell died at his home, 131 Bowdoin street, Springfield, Mass., on March 7, aged 65 years. He was prominently identified with the manufacture of Tiles, Mantels and Gas Fixtures. He is survived by his widow and one daughter.

The master plumbers of Brockton, Mass., are organizing an association for the purpose of conserving the interests of employing plumbers in Brockton.

A meeting of the Acetylene Association of England was held at the Westminster Palace Hotel, London, on February 27, for the purpose of perfecting the association and establishing it on a more permanent basis.

William T. Disley, Waterbury, Conn., has secured a large contract for plumbing in connection with the factory of the Farrell Foundry & Machine Company, in which he will use the fixtures made by the J. L. Mott Iron Works of New York City.

The Fairy Hose Nozzle, printed full size in bronze on a circular that is being sent out by Landers, Frary & Clark, 82 Chambers street, New York, gives a lifelike impression of a seasonable device which throws either a small stream or a spray controlled by means of a turnkey.

Thomas Kelly & Bros., Chicago, are sending to the trade a large mailing card showing a sectional view of the Kelly Siphon Jet Wash Basin, 500 of which have been used in the new Frick Building in Pittsburgh, Pa.

Pittsburgh, Pa., is to erect a $10,000 natatorium at the East End, to have a swimming pool 50 x 90 feet.

A bill is before the Legislature of Virginia to provide for a State board of examiners, who shall pass on the qualifications of plumbers applying for license, and to have plumbing inspectors as State officials.

It is stated that the loss to the Borough of Brooklyn, N. Y., through lax administration in the Water Department has extended over several years and will amount to some millions of dollars. While defective water meters are pointed out as one of the causes, the favoring of some classes of customers and the continuing in use of water meters known to be unfit for service is responsible for a far greater part of the loss. It is useless to blame unconscious mechanical devices for the conscienceless behavior of disloyal officials.

J. D. James, Storm Lake, Iowa, has added a heating and plumbing branch to his Hardware establishment, at Storm Lake, Iowa. He is overhauling the heating plant at the Park Hotel and equipping it with a fine system of plumbing. He is also heating and plumbing the new Roman Catholic parsonage, and the new home of the Rev. D. Williams. Mr. James has a number of other large jobs on hand, among which is the heating of the Universalist Church at Alta.

The County Commissioners of Nashua, N. H., are about ready to receive bids for plumbing and heating the new Court House to be erected during the coming summer.

A fire recently destroyed the plumbing shops of D. Parrett and S. C. Blake, at Marshalltown, Mich.

Attorney Charles R. Clapp, Toledo, Ohio, says the *News*, has two Coldwater, Mich., clients who are figuring on establishing a manufactory in that city for turning out Brass Goods and Bathtubs. The manufacturers were in the city on March 7, and looked over the manufacturing district. They want about 2 acres of ground, and their plant would employ 40 to 50 people, all told. They want a site on or near the belt railroad.

The Royal Heating Company, 210 Mason street, San Francisco, Cal., have recently installed the following plants: One in a large apartment house belonging to C. E. Knickerbocker, heating 35 apartments; a battery of boilers in the Claus Spreckels Building, and the Oceanic Steamship Company's offices; a steam heater in the parochial house of Rev. Father Peter S. Casey, and a steam heating plant in the residence of Samuel G. Murphy; also hot air plants in the San Francisco City Library and the Hotel Majestic. This latter job has just been successfully tested. It is a twin furnace plant with two large hot air pipes to heat 30 rooms. These rooms are heated equally as far as can be detected without the use of a thermometer.

George Callahan & Co., 218 Front street, New York City, are distributing a large sized blotting sheet bearing on one side the advertisement of their Old Reliable Pipe Joint Cement. This Cement is claimed to stand 500 pounds pressure on 18-inch flanged joints, and is said to prevent all leaks in steam, water, gas and oil pipes, and screw or flanged joints. It is also recommended for use on leaking tanks, and can be used with rubber or copper gaskets, or spread on canvas or other fabrics. The cement has established an enviable reputation during the 15 years in which it has been on the market.

New Firms and Changes.

Thomas Kelly & Brothers, Chicago, Ill., have been incorporated by W. R. Davies, L. Heislar and A. D. Bacci, with a capital of $75,000, to deal in and manufacture Plumbing Goods.

Lawrence Kling succeeds to the plumbing and heating business of Kling & Ballou, at 192 State street, New Haven, Conn. G. F. Ballou has withdrawn from the firm and will go to Jacksonville, Fla., where he will engage in business.

The Automatic Heat Regulator Company of Elkhart, Ind., have been incorporated with a capital of $10,000 by D. N. Lieb, H. C. Fidler, B. D. Hoseworth, C. E. Clark, J. P. Heasley, J. L. Harmon and J. C. Eberhart, Jr.

Simmons H. Isler, Jr., Kinston, N. C., informs us that he will open a plumbing, roofing and heating shop in that city on March 15, and would be glad to receive catalogues and price quotations from dealers in Plumbing, Roofing, Hot Air, Steam and Hot Water Heating Goods. He will also do lightning rod work, and will buy Old Metals and Rags.

F. A. Hancock of Morris, Minn., and E. C. Barnes of New York have started a plumbing and heating business, at Morris, Minn., under the style of Hancock & Barnes. They have already secured several large contracts and expect a good year's business. Catalogues from the trade would be acceptable.

William Bray's interest in the plumbing business of the firm of Treher & Bray, at Gloversville, N. Y., has been purchased by A. Treher, who will conduct the establishment in the future.

Joseph Fletcher has sold his plumbing business, at Summit, N. J., to M. Chrystal, and will hereafter be found in his employ.

The New York Centrifugal Trap Company of New York City have been incorporated with a capital of $100,000. The directors are F. T. Dwyer of Detroit and J. W. Brown and W. A. Bourne of New York.

The Purities Closet Ventilation Company of New York City have been incorporated with a capital of $100,000.

TRADE NOTES.

The Grasselli Chemical Company, Cleveland, Ohio, favor us with a copy of the artistic pamphlet which they are distributing in the interests of the various Chemicals of their manufacture. The publication is of a highly artistic character and contains a history of the business of the Grasselli Chemical Company, which has been conducted for the past 70 years. The company at present operate plants at Tremley, N. J.; North Tonawanda, N. Y.; Titusville, Boughton and Beaver Falls, Pa.; Cleveland, Ohio; East Chicago, Ind., and Birmingham, Ala. They also have branch offices and distributing stations in New York City, Milwaukee, St. Paul, St. Louis, New Orleans and Cincinnati, with other agencies in this and foreign countries. Among the leading lines of Chemicals manufactured by the company are Sulphuric Acid, Hydrochloric or Muriatic Acid, used largely for sheet iron and in galvanizing; Glaubers' Salt, Nitric Acid, Zinc Sulphate and Chloride, Glycerin, Blue Vitriol, Acetic Acid, Soldering Fluxes, &c. They are among the largest manufacturers of these materials.

In another column of this issue E. Bissell & Co., 12 Murray street, New York City, announce an important auction sale of Enameled Ware, to be held at their auction room on March 20 and 21. The sale, which is by order of the Lalance & Grosjean Mfg. Company and the National Enameling & Stamping Company, includes over 10,000 cases of Opal, Blue and White, Venetian, White and White, and Gray Enameled Ware. As all seconds of Enameled Ware are to be sold at auction and in no other way, this sale is of importance to the trade.

Pattern for Round Fork.

A correspondent at Tinsonburg, Ontario, writes: I note an inquiry was made in *The Metal Worker* of October 19, 1901, for a round crutch or Y, and inclose herewith my method of obtaining the pattern for same. I am a beginner in pattern drafting, and have studied the principles of this problem by my own thought, and if it is good enough to be published in your paper it would encourage me very much.

In Fig. 1 is shown the elevation of a 16-inch pipe, branching into two 8-inch pipes, running in opposite directions at an angle of 45 degrees. In Fig. 2, A C D E B is a reproduction of similar figures in Fig. 1. In Fig. 2 place the half profile X Y Z, using F as center. Divide in 10 or any equal number of parts, and draw parallel lines from each point to intersect line C D at right angles to C D. Then from each point on C D drop vertical lines indefinitely below the base line, as shown. This gives the projections from line C D of each space of the 8-inch pipe. Then from each intersecting point on C D draw horizontal lines to the right, at right angles to the vertical lines; this gives the hight of each space of the 8-inch pipe from base line. Now scribe one-quarter circle, S T, with R as center and A B as radius. Divide the same into one-half the number of spaces shown in the semicircle X Y Z. From each point draw horizontal lines any distance to the right; this gives the hight of each space on miter line, A B. Next scribe the semicircle I J K with H as center and B E as radius. Space the semicircle I J K into ten equal parts, and draw horizontal lines from each point until they intersect the line I K. Each of these lines gives the projections. Next scribe the semicircle L M N with O as center similar to X Y Z. Space the semicircle L M N into ten equal spaces. Draw horizontal lines from each point to the left until they intersect similar vertical lines drawn from C D, as shown, thus forming the horizontal section or oval space on C D. Now take the distance from 1′ to 1 in plan and place it, as shown, from P to 1′ in the diagram of triangles. Lift point from P to first elevation line, 1, of 8-inch pipe, and draw a line from 1 to 1′.

This gives the triangle 1′ P 1 on the line 1′ 1 in plan. Now take the distance from 1′ to 2 in plan and place it from Q on the base line to 1′. Raise point from Q to second elevation line, 2, of 8-inch pipe, and draw a line from 2 to 1′. Take the distance from 2′ to 2 in plan and proceed in the same manner as before until the point 6′ to 7 in plan is reached. Next take distance from 7 to 7′ in plan and place it from U on the line 7 to 7′ in diagram of triangles, and draw a line from 7′ to the elevation line, 7, of the 8-inch pipe. Now take the distance from 7′ to 8 in plan, which place from U¹ to 7′ in diagram of triangles, and draw a line from 7′ to 8 of the 8-inch pipe.

Proceed in this manner until all the triangles have been obtained. The slant line 1′ 1 of the triangle P 1′ 1 gives center line of pattern in Fig. 3 or E D in Fig. 1. The lengths of the slant lines of the triangles in P in Fig. 2 are shown in the pattern in Fig. 3 by heavy lines, while the lengths of the slant lines in Q in Fig. 2 are shown in the pattern in Fig. 3 by dotted lines.

The spaces at the top of the pattern are obtained from the half profile X Y Z in Fig. 2, and the spaces at the bottom of the pattern from K to I in Fig. 3 are obtained from the true section on B E in Fig. 2, while the spaces shown from K to H and I to H in Fig. 3 are obtained from the true section on A B in Fig. 2.

Note.—While our correspondent's drawings and description might have been a little more explicit, we be-

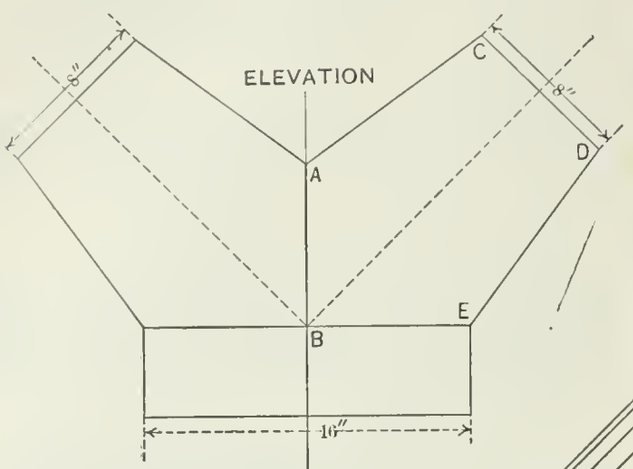


Fig. 1.—Elevation of Pipe.

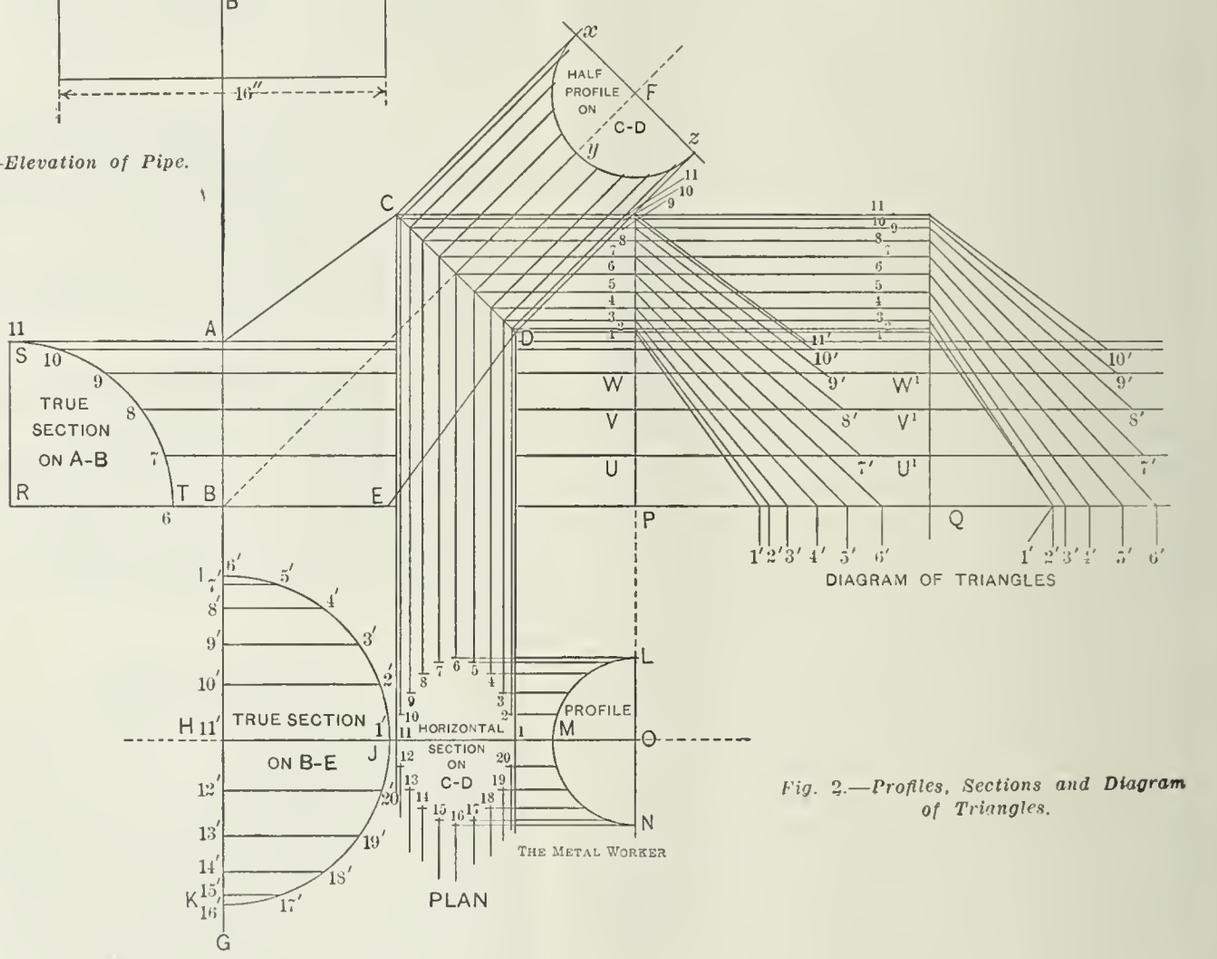


Fig. 2.—Profiles, Sections and Diagram of Triangles.

PATTERN FOR A ROUND FORK.

lieve they will be understood if gone over carefully. However, for our correspondent's information as well as for our readers generally, we would say there is a shorter rule for obtaining the pattern without the use of the plan. All that is required, providing the two arms are symmetrical, is the elevation shown in Fig. 1 and the size of the openings, whether they are round or any other shape. Take a tracing of A C D E B and place it as shown by similar letters in Fig. 4. Then on C D place the semicircle C Y D, on B E the one-quarter plan B E K, and on A B the one-half true section on that line, as A B T. With these profiles in position proceed in a similar manner as explained in connection with the problem entitled "Pattern for a Fork," published on page 54 of *The Metal Worker* for October 5, 1901.

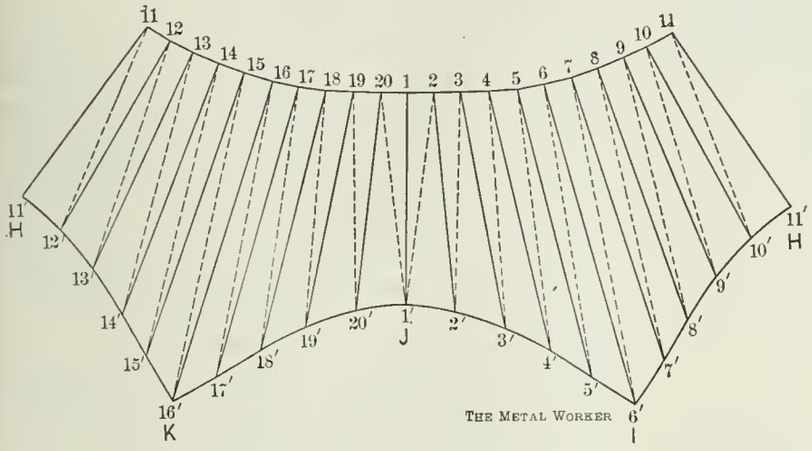


Fig. 3.—Diagram of Pattern for Fork.

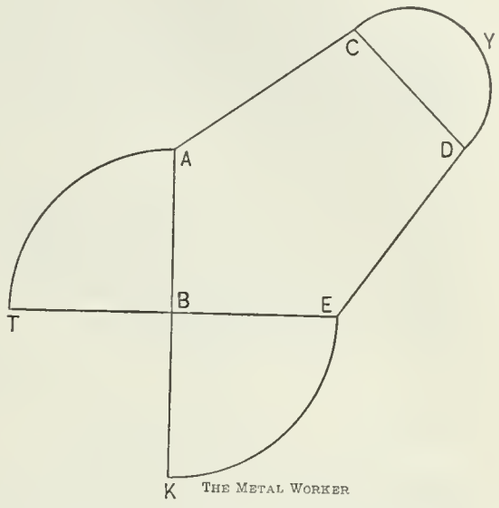


Fig. 4.—Shorter Method of Developing the Pattern.

PATTERN FOR A ROUND FORK.

The Tin and Sheet Mill Machinery Agreement.

Negotiations have been on for some time between the sheet and tin plate companies of the United States Steel Corporation and the foundries making sheet and tin mill machinery which were included in the agreements entered into on the formation of the respective companies for the supplanting of the old agreements by new ones, and the negotiations have now reached such a point that a final agreement is likely to be arrived at before the week is out.

The parties to the one agreement are the American Tin Plate Company on the one side and the nine foundries owned by the following concerns: United Engineering & Foundry Company, Mesta Machine Company, A. Garrison Foundry Company, George A. Hogg Iron & Steel Foundry Company, Lewis Foundry & Machine Company, Mackintosh, Hemphill & Co. and the Seaman-Sleeth Company. The latter company make chill and sand rolls exclusively. Mackintosh, Hemphill & Co. do not make rolls, and the United Engineering & Foundry Company own three plants, which were separate when the agreement was entered into. The other agreement is between the American Sheet Steel Company and these same foundries, with four in addition.

In both organizations the foundries are debarred from building outside tin and sheet mills, while the mill companies are required to give all their work to them. The advantage in the agreement to the foundries was in securing a monopoly of the orders of the mill companies at favorable prices, while to the latter there was expected to be an advantage in hindering the building of competing plants.

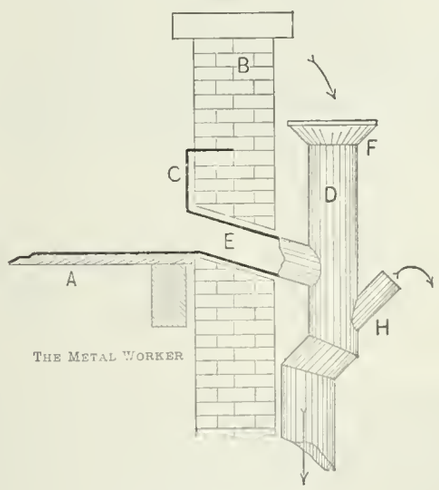
The experience of the past year or two has shown that the agreements have not prevented the building of independent mills, and on the other hand have brought into being a number of independent foundries whose competition has somewhat disturbed conditions. Thus both sides have for some months been desirous of terminating the agreements and the negotiations have been confined to a formulation of the terms. The agreements provided that they could be discontinued at any time prior to the five years for which they were entered into by mutual consent, the foundry side requiring the consent of two-thirds of the foundries.

The terms which are practically agreed upon are that the foundries are to continue to receive all the business of the tin plate and sheet companies, on a lower schedule of prices than formerly, while they are to be at liberty to take contracts also from independent mills. They will thus be given a broader market, while the two mill companies will get their machinery and rolls on very favorable terms.

The effect of the new agreement will be unfavorable to the independent foundries which have been built recently, as no additional business is assured them by the new arrangement, and they will have strong competition for the business of which they have heretofore had a monopoly.—*Tin and Terne.*

THAWING FROZEN LEADERS.

A difficulty often experienced at this time of the year is keeping leaders clear of ice. Where the gutter is connected directly to the leader it is an easy matter to clear



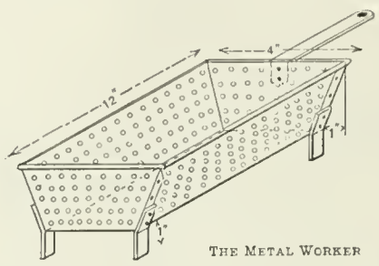
Thawing Frozen Leaders.

the ice in the pipe by means of rock salt and hot water, but where a tube passes through the wall or any other part of a building, and an elbow is the result, it can be accomplished as follows: Referring to the accompanying sketch, let A represent the roof, B the parapet wall and C the flashing connecting with the tube E,

which joins the leader D. The pipe, it will be seen, extends upward, to allow it to be easily reached from over the wall, and has a flaring collar, as shown at F. A small offshoot, H, can advantageously be placed in the position shown. When the leader freezes place rock salt in the tube E and the pipe at F, and if convenient pour hot water into the pipe. Should the ice melt on the roof and the water flow into the tube E when the pipe is not open all the way down, the water can overflow at H and will not back up on the roof nor flow under the flashing C. If this precaution is taken the leader pipes can be kept open all winter.

REPAIRING TIN ROOFS.

This is the time and season of the year when the roofer is called upon to do the necessary repairs to tin roofs, and perhaps a few hints on this subject will not



Repairing Tin Roofs.—Fig. 1.—General View of Paint Burner.

be out of place. Where the roof is in very bad condition, or where a leak must be closed temporarily until the weather is more favorable, the spot or leak should be thoroughly dried and a thick coat of red lead applied, over which a piece of cheese cloth should be spread. Then over this roofing cement can be placed, which will make a temporary tight job.

When repairing the roof a hand blow torch can be used to blister the old paint, and while hot the paint

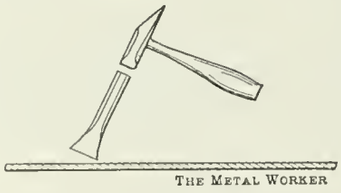


Fig. 2.—Using the Hammer and Chisel.

and dirt can easily be wiped off with an old cloth and a clean, bright surface left, which is readily repaired with solder. When no blow torch is at hand a paint burner can be used. This device is shown in Fig. 1, which readily explains itself. It is made of black sheet iron, with ⅜-inch holes punched in it, as shown. To this are riveted four legs about 1 inch long. The heat is obtained by using charcoal. A few hot coals are first taken from the fire pot and placed in the paint burner, after which the charcoal is broken into pieces about 1 inch in size and placed over the hot coal, the burner being filled with these up to the top. The draft which is created through the perforations soon has the coal in a blaze. The burner is then set over the spot to be repaired. In a few minutes the paint blisters and can be cleaned with an old cloth.

It is sometimes the case that quite a portion of an old roof is to be stripped or taken off. When a hammer and chisel are employed, as shown in Fig. 2, a considerable amount of time and labor are required. A labor saving tool designed for this work is shown in Fig. 3, which is a tin cutter and scraper combined. It can be made by any blacksmith of ¾-inch hexagon steel, about 12 inches long. When cutting the old tin it is used as in diagram A, where the cutter is shown slightly tilted, so that the corner of the knife cuts into the tin roof when struck by the hammer. In this manner a long stretch is cut in a few minutes, as compared with the slow use of the hammer and chisel in Fig. 2. When a scraper is desired for scraping tin roofs then the scraper part of the tool can be used, as shown at B in Fig. 3. Thus the two tools are combined in one, making a useful addition to a workmen's kit.

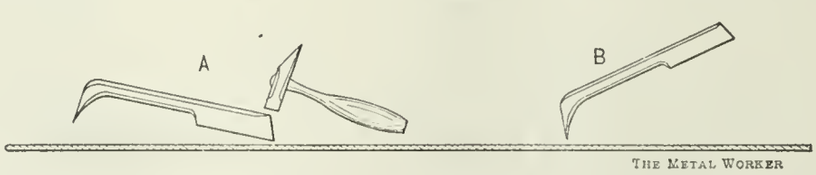


Fig. 3.—The Scraper and Tin Cutter in Use.

Meurer's Felt Roofing.

Meurer Brothers Company, 569 to 577 Flushing avenue, Brooklyn, N. Y., are distributing an attractive circular relating to Meurer's felt roofing, a new line of manufacture which the company have taken up. This roofing is described as being made with a foundation of pure wool felt, thoroughly saturated and rolled out under great pressure. The saturating compounds are said to provide an absolutely water, acid, gas and fume proof substance, making the roofing of value in places where the roofs are subjected to severe tests of acids or gases of any kind. The material contains no tar, consequently it does not become dry and brittle under the action of the weather. It is also claimed to be equally free from danger of cracking in winter or running in summer, and being of a noncombustible nature, is not apt to ignite from burning sparks falling upon it. The roofing is described as light in weight and as being adapted for laying on either flat or steep surfaces. It is made in four different thicknesses, suitable for all kinds of buildings, and is packed in rolls 72 feet long and 3 feet wide, containing two squares (200 square feet) each. It is also recommended for flooring, being extremely durable and capable of wearing for a long time under severe conditions. The half-ply can be used as a sheathing paper and for insulating purposes.

Attention is also called to Meurer's roof paint, which is especially recommended for coating Meurer's felt roofing. This paint is said to dry quickly with a deep black color, to remain perfectly elastic and to be capable of withstanding the action of acids, alkalis and gases to a remarkable degree. It is also well adapted for painting all kinds of prepared roofing and wood roofs, and also as a protection against dampness or acid fumes. Meurer's black enamel paint is another product of the concern, which is claimed to possess the same qualities a stheir roofing paint, and to be a sure rust preventive for metal roofs, iron work, pipes, &c. This paint is said to stand great heat without peeling or crackling and to absolutely retain its flexibility under all conditions.

From the office of the Wheeling Corrugating Company, at 917 Sansom street, Philadelphia, we have received an illustrated folder calling attention to the Stamped Steel Architectural Metal Work for churches, schools, theaters, hotels, public buildings and private homes manufactured by the company. The circular presents some illustrations of Sheet Metal Ceilings and Side Walls of highly artistic design, and states that estimates for material or for Ceilings arranged complete will be furnished upon receipt of application, accompanied by drawings or sketch giving measurements.

It is reported that the Southern Rolling Mills Company, to be incorporated with a capital stock of $60,000, by Ben S. Catchings, James Dwyer and W. L. Sims of Birmingham, Ala., will probably erect a Sheet Steel plant at Ensley, Ala.

THE TIN PLATE TRADE IN ENGLAND.

FROM OUR LONDON CORRESPONDENT.

Doubtless due to the present high prices of metals in the United States, the British tin plate trade has been having a rather happier time than usual. Employment has been fair, the month of January showing an improvement upon the month of December. At the end of January, 43 works, with 206 mills, had all their mills in operation, while 34 others had 179 mills at work, out of a total of 241. That makes 385 mills in work, compared with 378 at the end of December and 295 a year ago. The number of workmen employed at the end of January was, as nearly as possible, 19,200. I herewith subjoin a tabulated statement which will set the facts out clearly:

	No. of works open.	No. of mills in such works Working.	Not working.	Total
Works giving full employment	43	206	..	206
Works giving partial employment	34	179	62	241
Total at end of January, 1902	77	385	62	447
Corresponding total for December, 1901	77	378	64	442
Corresponding total for January, 1901	60	295	50	345

EXPORTS OF TIN PLATES.

I give herewith the chief totals of exports of tin plates and black plates for the month of January:

	Tin plates.			Black plates.		
	Jan., 1902.	Dec., 1901.	Jan., 1901.	Jan., 1902.	Dec., 1901.	Jan., 1901.
United States	7,977	8,406	4,673	....	37	....
Other countries	18,051	16,367	16,928	4,637	4,145	5,151
Totals	26,028	24,773	21,601	4,637	4,182	5,151

FOREIGN TIN PLATE CUSTOMERS.

With a view of showing who are England's tin plate customers, it will not be without interest if I reproduce in full the total, both in quantities and values, of Great Britain's tin plate exports for last year, together with a comparison for the previous year:

Tin Plates and Sheets.

	Quantities.		Value.		Quantities.		Value.	
	Year ended December 31.				Month ended December 31.			
	1900.	1901.	1900.	1901.	1900.	1901.	1900.	1901.
Russia	32,724	30,188	£431,207	£397,918	5,171	2,698	£75,161	£33,824
Germany	18,257	10,608	276,710	148,938	1,143	822	16,906	11,527
Holland	14,810	12,629	216,056	181,130	1,634	1,192	23,956	16,437
France	23,436	15,649	303,860	211,147	1,534	1,002	21,378	13,455
Portugal, Azores, Madeira	5,678	7,345	80,441	99,210	479	279	6,975	3,582
Italy	3,285	2,785	54,260	38,061	153	189	2,271	3,019
Roumania	2,425	3,051	31,514	40,116	168	....	1,875	....
United States	58,043	75,819	786,249	1,000,905	4,923	8,406	65,751	113,786
Brazil	4,439	3,242	74,187	45,945	441	421	6,585	6,624
Argentine Republic	4,714	3,651	73,734	50,491	356	551	5,498	8,110
British East Indies	22,676	25,558	344,725.	354,659	2,008	2,694	26,351	38,208
Australasia	19,959	17,379	322,670	251,892	1,481	1,115	22,693	16,980
Canada	22,101	16,886	338,755	245,195	1,042	1,290	16,096	19,353
Other countries	40,330	46,167	642,428	641,351	3,799	4,114	57,795	57,055
Totals	272,877	271,657	£3,976,796	£3,706,958	24,332	24,773	£349,291	£341,960

Finally, I subjoin another table giving the average number of mills in operation and the total exports of tin plates and sheets, and also black sheets, for the last six years:

Year.	Average number of mills in operation.	Exports of- Tin plates and sheets.	Black plates.
1896	318	266,963	48,405
1897	323	271,230	58,648
1898	322	250,983	58,327
1899	381	256,373	85,729
1900	384	272,877	66,278
1901	343	271,657	51,367

ORDERS FOR BLACK SHEETS.

Some large orders have just been placed in this country for black sheets for Canada, and there are inquiries for 10,000 tons more of them. Mexico is also a heavy buyer of black sheets just now, but sellers are not inclined to commit themselves at the present prices for future deliveries.

THE QUESTION OF BRANDS.

It will be within the recollection of your readers that some little time ago I drew their attention to a question which excited some interest over here as to the branding of tin plates. The movement seems to be fizzling out. This is doubtless due, to some extent, to the action taken by the Newport (Monmouthshire) Chamber of Commerce, whose secretary made various inquiries and received certain replies. With one exception these replies did not favor any alteration. The Ebbw Steel Sheet & Galvanizing Company, Limited, of Abertillery, agreed that the words suggested would more correctly describe their production, but they doubted whether the trade generally would agree to the change. They, however, favored the alteration. The Redbrook Tin Plate Company, Limited, of Pontnewydd were of opinion that the suggestion made that all coke tin plates should be called Bessemer and all charcoal tin plates Siemens-Martin would cause the greatest confusion in the trade. Charcoal and coke now only indicated the finish of the tin plate, and if the buyer wanted any particular steel all he had to do was to stipulate for it when the contract was made. The Treforest Tin Plate Works of Treforest wrote that, as they only supplied one class of plates—viz., Bessemer steel cokes—the change suggested would not afford them in any way. L. C. Corfield & Co. of Newport stated that the present custom had been long established and was so well known that they did not think it was worth agitating about. Some of the firms approached stated that they were not now makers of tin plates, and it also appeared that many of the works were stopped. It was resolved that in the opinion of the Newport Chamber it was inexpedient to alter the present method of branding in the tin plate trade.

FLASHINGS.

MANY of the Sheet and Tin Plate mills in the Pittsburgh district suffered from the flood last week. Some of them were compelled to shut down entirely, and others remained partially idle. This occurrence was particularly unfortunate, as the mills are all loaded down with orders, and any restriction of production at this time is liable to impose considerable inconvenience upon purchasers who are awaiting the shipment of delayed orders in order to complete contracts in hand.

DURING the last few days negotiations were renewed for the absorption of the American Can Company by the United States Steel Corporation. A premature announcement made this week may interfere seriously with the consummation of the project, however.

HENRY WEYAND, Waterbury, Conn., has the contract for the Cornices and Skylights for the Chapman Block in that city. He is also doing the roofing and metal work on the Schlitz Building.

AT a recent meeting of the council of the Tin and Sheet Mill Men's Union, at Swansea, Wales, President T. H. Gwynne referred to the opening of new markets in South Africa, and suggested that the men should contribute 1 shilling per month for five months. With some 10,000 men engaged in the trade this would amount to £2500. If the employers contributed an equal amount they would be able to send out men to South Africa to ascertain the possibilities of extending the trade there in Tin and Terne Plates and Sheet Steel.

THE WELSH TIN PLATE MANUFACTURERS' ASSOCIATION has invited the workmen to a conference to consider

the wage scale to be adopted after June 30, when the present agreement expires.

The International Tin Plate Workers' Protective Association, composed mainly of tin house workers, will open its fourth annual convention on Monday, May 5, at New Castle, Pa. The headquarters of the association are at present located at Wheeling, W. Va.

The American Rolling Mill Company of Chicago, who operated a steel furnace and sheet mills at Muskegon, Mich., have stopped operations at that place on account of the high price of Scrap, and it is reported that the plant may not be operated in the future.

The new Sheet mills which the Newport Rolling Mill Company, Newport, Ky., are erecting are expected to be completed early next month.

The Wais-King Tool Company, recently incorporated, have completed their plant at Winton place, Cincinnati, Ohio. The building is a two-story structure, 80 x 160 feet, well lighted and ventilated and equipped with the latest improved appliances. They are putting on the market a line of Punches and Shears with improved features.

R. Tynes Smith has resigned the local management of the American Can Company in Baltimore, Md., and has gone on a trip of combined business and recreation to Cuba and Nassau, West Indies, in the latter of which islands he has large fruit interests. On his return Mr. Smith will devote himself to his large packing interests in Baltimore. Mr. Smith's Can factory, which was one of the largest absorbed by the American Company, is now being still further enlarged and improved.

The Heppes Company, Chicago, have been incorporated to manufacture and deal in Roofing and Roofing Material, with a capital stock of $10,000, by H. W. Bennie, O. A. Heppes and John R. Philip.

Paint to Prevent Tin Cans from Rusting.

The following instructions as to the proper paint to be used for the outside of tin cans that are exposed to dampness is given in the *Painters' Magazine:*

It has long since been determined by scientific researches that linseed or any other oil is not impervious to water; on the contrary, that they soak up water almost like a sponge, hence some other preparations are required to protect metal from rust in the presence of water. We should recommend that the cans be first thoroughly cleaned, to remove all grease, &c., with soda water, then rinsed and thoroughly dried. Now a thin coat of equal parts white lead and zinc, thinned with turpentine and a little coach japan, to which good varnish—say a tablespoonful to each ½ pint of paint—is added, should be given, and when this is dry a coat of enamel, made from zinc in damar varnish, colored to suit fancy, thinned with a little turpentine and mixed with sufficient hard drying coach varnish to work freely, applied as a finish. If each coat could be conveniently baked from four to six hours at a temperature of about 150 degrees F. it would resist water far better than the air dried paint.

The seventh annual convention of the National Association of Manufacturers will be held in Indianapolis, Ind., on April 15, 16 and 17. Local arrangements for the convention are being made by a committee of Indianapolis business men under the leadership of D. M. Parry, who has been for many years a member of the Executive Committee of the association, and a particularly hospitable welcome to visitors is assured. Members of the association are manifesting more interest than usual in this year's convention and there is promise of an unusually large attendance from all parts of the country.

Sir Charles Grandison is credited with saying that bores had great charms for him, in that he could never tell what particular form of annoyance they would manifest. This applies to the action of trades union men in England, for they are prolific in surprises. In a certain locality the men struck for a trifling matter and were discharged, the proprietors engaging non-union men. Suit was at once brought against the owners of the works, ordering them to show cause for depriving the men of their living!

The Elmira Reformatory Trade School.

E. E. Clark, director of the trade school of the New York State Reformatory, at Elmira, N. Y., who was a visitor this week at the office of *The Metal Worker*, reports that important extensions and improvements are in contemplation at Elmira in connection with this department. Should the appropriations from the State be sufficient it is proposed to erect new buildings for the accommodation of the trade schools, thus systematizing the work and making it more efficient. Between 400 and 500 young men are each year paroled or discharged from the reformatory with sufficient knowledge of some trade to enable them to make an honest living when again thrown upon their own resources. Some of the inmates who spend a longer time in the reformatory are, on discharge, equipped with sufficient knowledge of the theory and practice of a trade to enable them to become journeymen. Employment is secured by the authorities for numbers of young men each year. The result of this work has been highly satisfactory. Hundreds of youths, who otherwise might have been forced to return to a life of crime, through their equipment with a means of livelihood, have been given the opportunity and encouragement to lead an honest life. Some 30 separate trades are taught at the present time in the Elmira Reformatory. Each of the inmates is obliged to take up some line of industry, and for ten hours each week is given trade instruction. Mr. Clark is convinced that this is the most satisfactory solution of the question of the disposal of young prisoners. It is the most effective reformative method yet devised.

Melting Loss in the Foundry.

A bulletin of the American Foundrymen's Association contains the following data on melting loss in the cupola which used burnt material:

A. A selection of burnt grate bars, in fair condition, was remelted, the charge of 2000 pounds resulting in 1875 pounds of good material. Melting loss, 6¼ per cent. The castings were entirely white; 0.4 per cent. of ferromanganese was added to a quantity of the melt; this, when set, was gray in fracture. Evidently the high silicon in the ferromanganese did it. Another test with this treated material gave a depth of chill of 7-16 inch.

B. Two thousand pounds of the worst burnt grate bars were now melted, resulting in a melting loss of 8 per cent. The castings were again white, and this time the addition of 0.4 per cent. of ferromanganese had very little effect on the fracture. Similarly the chill obtained was 12-16 inch.

It is very evident that the ferromanganese, with its high silicon, expended itself in removing the oxidation effects, and could do little in promoting the formation of graphite.

It is reported that the Southern Pacific Railroad Company are making elaborate preparations to equip all the locomotives throughout their entire system for the use of oil as fuel. Experiments along this line have proved to the company the efficiency and economy of oil fuel, and they are now preparing to erect a large number of immense tanks for the storage of oil at a number of points on their lines.

The Clark Mfg. Company, Buffalo, N. Y., have recently made Allerton-Clarke Company, 97 Chambers street, New York, their selling agents for the goods of their manufacture for the territory embraced by the Eastern, Middle and Southern States, Ohio, part of Indiana, Canada and the Provinces and export. The goods of this company include the various kinds of genuine Clark's Blind Hinges and other Hinges known under various names. Loose Pin Butts, Spring Hinges, Sash Pulleys, Stove Pipe Dampers, Sash Cord Irons, Lid Lifters, Boiler Handles, Bed Fasteners, Shelf Supports, Sink Brackets, &c.

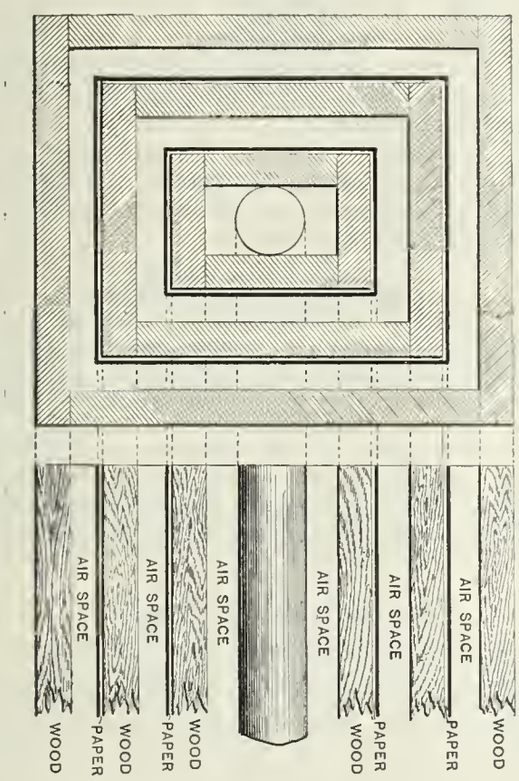
THE LETTER BOX.

Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

PROTECT TANK PIPE FROM FREEZING.

From W. T. M., Ridgewood, N. J.—Replying to the inquiry of "S. S.," in *The Metal Worker* of February 8, in reference to protecting the supply pipe to a tank from freezing, my experience has been that I have been unable to find any non-conducting material that would protect a supply pipe to a tank from freezing, and I have tried all the best loose and sectional nonconducting materials that have been recommended and placed on the market. I have always found, after the covering has been on for one year, that it would help freezing in the pipe, owing to dampness brought on by the atmosphere. I have experimented with the different methods of wrapping, covering, boxing, &c., and the method that I suggest to "S. S." will absolutely prevent the water in the pipe from freezing if the temperature be 20 degrees below zero. Place around the supply pipe what may be termed a three-ply box, a cross section and an elevation of which are shown herewith. This box must be attached to the bottom of the tank with an air tight connection and must extend at least 3 feet into the pit below the ground. Each section of the box should be made of ⅞-inch finished pine boards or something equal. The first box, in order to cover a 2-inch pipe, should be 4 inches wide to allow for laps, and 2¼ inches deep from front to back. This leaves an air space all around the pipe. When this has been connected to the bottom of the tank, so as to be air tight, it should be wrapped with sheathing or manila paper from top to bottom carefully, so as to be as near air tight as possible. When this has been completed 1 inch square cleats should be nailed on the box about 5 feet apart, to which the outer boxing or next ply of the box is to be fastened, equalizing the air space all round. When this has been completed, taking the same care to make an air tight connection at the bottom of the tank, it should be wrapped with the paper the same as the first ply. On the outside nail more cleats of the same size to provide an air space, and put on a third box, to be made of 12-inch wide finished boards, which can be painted to preserve them. The second ply can be made of 8-inch boards. If "S. S." will adopt this method I can assure him that he will profit by it, for having met with the best success in using this method for the last eight years I can say from experience that it is better than anything else I have tried. I have experimented with it and given it the severest kind of test and I have never had a frozen pipe which has been protected in this manner.



Protect Tank Pipe from Freezing.

WANTS A PRACTICAL WATER HEATER.

From W. W., New York.—There seems to be a demand in these days, even in small two-family houses, for hot water, to be supplied by the owner the year round, as well as heat in the winter. The trouble with the kitchen boiler is that in summer the occupants of the house seldom use the coal range, depending entirely upon the gas stove. Consequently there is no supply of hot water when it is needed in the heated season. How to overcome these difficulties economically seems to me to be an interesting topic for discussion. There are many contrivances on the market to supply hot water, such as the gas attachment to the kitchen boiler and the instantaneous water heater, but, so far, these have been too expensive in operation or in first cost to suit the demand. The regular hot water supply heating apparatus and a coil contrivance in the cellar furnace depend on the kitchen boiler, and consequently are useful only in winter. I cannot answer this question to the satisfaction of myself or my customers, and hope that the readers of *The Metal Worker* can alleviate the conditions by throwing some further light upon them.

RETINNING COPPER WARE.

From E. & J., New Britain, Conn.—Will *The Metal Worker* please explain how to retin old copper, and how to clean it properly so that the tin will adhere to it, particularly as to retinning of old wash boilers and old coffee kettles?

Answer.—The following article from a special contributor is reprinted from a previous number of *The Metal Worker:*

For the benefit of those who, without previous experience in this kind of work, may be called upon to retin copper cooking utensils, at the outset it is to be kept in mind that only the most careful attention to every part of the work will give good results. The finish obtained on the tinned article will depend on the thoroughness with which every part of the work is done. We will suppose that we have a small portable forge to work on, as it is the best for the purpose. A fire of charcoal or coke is to be preferred, as the heat is more diffused than with coal. Having a bright red fire we will take the articles just as they come to us from the hotel, ship's galley, &c., and, placing them one at a time on the fire, keep turning it until it is heated all over. It is allowed to heat until it turns black inside. We have beside us a quantity of sal ammoniac, which has been pounded into a fine powder, and we sprinkle it a little at a time over the whole inside. Taking a wad of tow, which can be obtained at a ship chandler's or rope factory, or even can be made by teasing out a new rope, we wipe out all the burnt grease, wiping firmly round the inside, taking care to clean around the handle rivets.

We now take our copper off the fire and allow it to cool till we can just bear our hand on it, and then pour into it enough raw muriatic acid to cover the bottom to, say, a depth of ½ inch. The acid is swilled around the inside with a rod having a wad of tow tied on the end. It is best to allow the acid to remain in the vessel for a few hours, swilling it, say, once every hour or two, as may be necessary. The acid is now poured out to be used again and the pot washed in water. With a handful of tow and some wet, sharp sand, we now scour the inside, and if the burning and pickling have been well done it will be found it is quite clean and smooth. If the work is meant to have a gloss and have a surface feeling like glass to the touch, it must be scoured a second time with very fine sand that contains no gritty matter. A little experience will enable the workman to pick out such places as will not tin properly or appear rough on the finished articles, and at this stage they must be scraped. The scraper should be broad and sharp, and leave no marks to be seen through the tinning.

Having scoured the outside bright, we wash out in cold water and cover the inside with pounded sal ammoniac diluted with water. The outside is also covered with whiting and salt. Taking a handful of whiting and

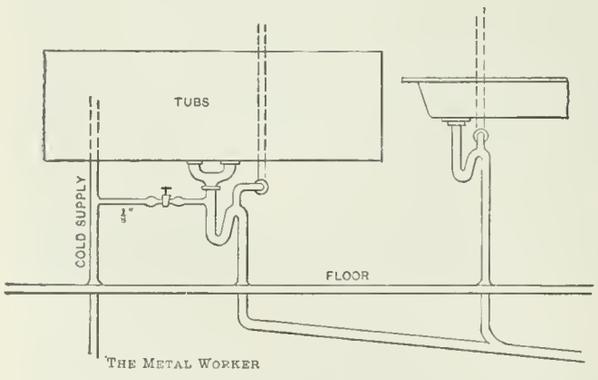
just covering it with salt will give about the right proportions. Mix it into a paste with water. The article is now ready to tin, so we put it on the fire and heat it, turning it till it is heated evenly all over. When it has reached the proper temperature it will melt a few pieces of pure block tin which have been placed in it. We now, beginning on the bottom, with a wad of clean tow wipe the tin all over it and cover it completely. It is well to sprinkle just a pinch of sal ammoniac on the copper if it does not tin nicely, but we are to remember that the fumes from the sal ammoniac are very apt to cause the job to appear white instead of brilliant. We now turn the pot on its side and wipe the melted tin around a portion at a time till it has covered every part, then wipe the surplus tin with a quick motion into a pan placed beside the fire. It is advisable to have some muriatic acid, which has been cut with zinc, at hand, and to daub it on any spot over which the tin does not flow well, but the hot copper should not be scraped if it can be avoided.

Without allowing the article to cool we put it back on the fire, and with a wad of cotton waste, free from grease but dipped in very fine ashes, we go all over the inside again, beginning in the center of the bottom and wiping spirally toward the sides. No sal ammoniac nor acid is to be used this time. We wipe the sides with somewhat of a zigzag motion while working gradually around. This part of the work may require a little practice to accomplish the best results. Before the copper has cooled we plunge it into clean, cold water, and wash off the whiting and salt from the outside. The inside should not be touched at all, and care must be taken to change the water frequently, for the least salt, sal ammoniac or acid in the water will turn the inside dark in color.

If the copper has become cold while we were working it off we must immerse it in hot water, and lifting it out quickly dry it outside by rubbing in a box of sawdust. The article should not remain exposed to the air after it has been washed and before it is dried or it will tarnish. It may be necessary to give the outside a second scouring after the article is tinned, if it is found that the sand has left it dull. That, however, depends on the nature of the sand. A good plan to get the proper finishing sand is to wash out the scouring wad in water, and take the sediment that will accumulate in the bottom of the vessel we wash in. If every part of the process is carefully done, with a little practice the workman will have very little difficulty in turning out a good job. The inside and outside will be perfectly smooth and have a nice gloss.

QUESTIONS ON WASH TRAY TRAPPING.

From H. A. K., Allentown, Pa.—Having seen the articles on the above question in *The Metal Worker* of February 8 and March 1, I give as follows my views on the



Questions on Wash Tray Trapping.

matter: The connections as shown in Fig. 2, February 8, I think, are correct and perfectly sanitary, but if there should be any possibility of the seal being broken in the trap under tubs I think that the addition of a running trap, as shown in the cut of *The Metal Worker* March 1, would be very unadvisable, as the distance from the running trap to the tubs is too great and there would naturally be a foul odor coming out at the wash trays. Now I think that by connecting the trap according to sketch herewith all difficulties would be overcome. To always keep the trap under the wash tray sealed allow the water from the tub supply to constantly run into the trap through a ⅛-inch pipe, as shown, and regulate the amount by a small cock.

SAFETY VALVE ON KITCHEN BOILER.

From F. V., Chestertown, N. Y.—I am going to install a kitchen boiler where the water pressure is very light. Would it be advisable to place a safety valve on the boiler? The air collects occasionally in the pipe between the house and the spring which supplies the water and stops the flow. Never having used a valve of this kind, I would like to know the kind to use and the manner of connecting it with the boiler.

Answer.—There seems to be no occasion to place a safety valve on a boiler under the conditions mentioned, provided the boiler has a delivery tube with a hole in it near the top. Then should the flow of water from the spring stop from any cause the boiler would remain full of water, and this would circulate through the water back and prevent its destruction. If, while the fire is running strong, the water supply should stop, it might result in steam being generated, but as this steam could exert its influence to drive the air out of the supply pipe and start the flow of water again there would be no danger of the boiler being burst from excessive pressure. If, however, the safety valve is deemed necessary it can be furnished by any supply house.

WANTS SOLDERING FLUX FOR ALUMINUM.

From A. N. Y., Ashley, Ohio.—Will *The Metal Worker* please ask some of its readers to give a good solution for soldering aluminum?

Note.—We shall be glad to present anything our readers may contribute on this subject. In the meantime we would refer our correspondent to the flux given in *The Metal Worker* of March 8.

ADDRESSES WANTED.

Will "F. H. W." of Parkville, N. Y., whose application for assistance with a troublesome chimney was presented in *The Metal Worker* of January 18, please send in his address, as there are communications awaiting him that may be of interest to him?

We have received a communication from "Reader," Lexington, Ky., but before presenting it desire his name and address, as requested at the head of the Letter Box department.

An Aluminum Solder.

The following recipe for soldering aluminum, which is claimed to do the work effectively, is given in a contemporary: Twenty-eight pounds of block tin, 14 pounds of phosphor tin—10 per cent. phosphorus—3½ pounds of lead and 7 pounds of spelter. The following instructions should be followed when soldering aluminum: Clean off all dirt and grease from the surface of the metal with benzine, apply the solder with a copper bit, and when the molten solder covers the surface of the metal scratch through the solder with a wire brush, by which means the oxide is broken and taken up. Quick manipulation is necessary.

Jacob S. Wolf and Louis K. Englert of West Catasauqua, Pa., are the discoverers of an alloy of metal produced by the admixture of copper, tin, iron and salt. The metal, it is claimed, may be used for all general purposes, such as the manufacture of tools, armor plates and other products where a tough, strong and durable material which will not corrode is desired. The composition consists of 85 parts of copper, 4 parts of tin, 6 parts of iron and 5 parts of salt.

It is well known that a free use of oil will surround a vessel with a comparatively smooth water even in the roughest storm. An experiment has just been successfully made in England with a cannon that throws a shell designed to spread oil on bolsterous waves. A shell made of wood, containing about 2 gallons of oil, is used. It is conical, and at one end is a vent; this is covered with paper, which is blown off as the shell leaves the piece. The apparatus is intended to provide a smooth path through which a lifeboat can make its way to disabled vessels.

TRADE REPORT.

MARKET SUMMARY.

Pig Tin is 1c. higher, owing to light arrivals.

Copper is quiet, with stronger tone.

Pig Lead is unchanged.

Spelter continues dull and without change.

Antimony shows no change.

Nickel is in good demand at former prices.

Aluminum is active and without change.

Tin Plates are firm and quiet.

Sheets are very strong and demand urgent, on prospect of scarcity.

Sheet Copper is in good demand, and firm in price.

Scrap Iron is very strong and scarce.

Scrap Brass and Copper are strong and higher.

Foundry Iron is growing scarcer, and prices are advancing.

Hardware is in excellent demand, with strong tone.

Solder rules ½c. higher.

Malleable Fittings have been advanced 10 per cent.

Cast Iron Soil Pipe and Fittings are very strong, and may advance again.

Radiators are about 10 per cent. higher.

Wire Cloth is firm, with upward tendency.

Poultry Netting is also firm, with large demand and outlook for higher prices.

Cold Punched and Hot Pressed Nuts have been advanced in price.

Sash Weights rule somewhat higher.

Wire Nails are very firm and active.

Cut Nails are firm with light stocks.

Window Glass may be advanced slightly.

White Lead is moving freely, with prices firm.

Linseed Oil is firm at former quotations.

Spirits Turpentine is ½c. a gallon higher.

METAL MARKET.

NEW YORK, March 14, 1902.

Pig Tin.—Owing to meager arrivals the price of spot Tin has advanced about 1c. since last week. Futures are not so strong, however, and have sold at a considerable discount. Trading was not heavy either in spot or futures. Consumers are buying very cautiously, and aside from the tardy manner in which the metal is coming in there were no interesting features in the market. At the close a somewhat easier tone prevailed, but spot prices showed no decline. Straits Pig in small lots is quoted by jobbers at 27½c. to 28c. per lb.

Copper.—The market for Copper has been very quiet. The undertone, however, is much stronger than it has been for some time, while the consumptive demand shows some improvement. Jobbers' prices are unchanged, Lake Ingot in small lots being quoted at about 13¼c. to 13¾c. per lb., and Casting Copper at about 13¼c.

Sheet Copper.—The demand for Sheet Copper keeps up in good volume and inquiry is active. Consumers are apparently of the opinion that the price of Sheet Copper is not likely to decline in the near future, and in consequence are placing their orders more freely. A large consumption of the material is looked for this year in all quarters. Prices are firm on the basis of 18c. per lb. from store.

Pig Lead.—The market is entirely unchanged and without interesting feature. The business done was of moderate proportions and confined mainly to purchasing for immediate requirements. Prices are firmly held. American Pig, in small lots, is quoted at 4.45c. to 4½c. per pound. The St. Louis market is reported quiet with unchanged prices.

Spelter.—But little is doing in this metal. The market continues dull and a shade lower for wholesale lots. Retail prices are unchanged, Western brands in small lots being quoted at 4.60c. to 4.70c. per lb. The market in St. Louis was quiet but firm.

Antimony.—This metal is without change. Hallett's is quoted at 8⅝c. to 8¾c. per lb. in small parcels; U. S. at 8⅝c. to 8½c., and Cookson's at 10¼c. to 10¾c.

Nickel.—No change has taken place in this market. Small lots are quoted at about 55c. per lb.

Aluminum.—There is no change either in price or in the volume of business, which continues good. Small lots of No. 1 Ingot guaranteed 99 per cent. pure are quoted at 37c. per lb., and 100-lb. lots at 35c.

Tin Plates.—Nothing new is to be noted in connection with this market. Deliveries on contracts are being made in large volume, and current orders are of routine type. Nothing important in the way of large new business has come to the surface, and the retail trade in this section has been rather dull, owing to weather conditions, which have interfered with out of door work and also with communications. Prices are entirely without change. American Bessemer Coke Plates, IC, 14 x 20, in small lots, are selling at about $4.85 to $5 per box at New York and corresponding points.

Sheets.—The Sheet market continues to show great activity, and prices are very firm but no higher. Notwithstanding that the output of both Black and Galvanized Sheets is heavy, there is still complaint of delay in deliveries on contracts, especially on some of the more popular gauges. All the mills are comfortably filled with orders for the next two or three months. The floods have interfered somewhat with shipments, which accounts in a measure for the delays in receipt of material. The prospects indicate a considerable shortage of Sheets during the spring and summer months, which fact tends to further stiffen the market. Jobbers' prices are very firm. No. 27 One Pass Cold Rolled Soft Steel Sheets, in small lots from store, are quoted in New York at 3.90c. to 4c., and Galvanized Sheets at 67½ and 5 per cent. to 70 per cent. off the list.

Chicago advices are as follows: A great deal of business in Sheets is now being done, with all mills well sold up and prices ruling firm. The mills are far back on deliveries of 10 to 14 gauge, and importations of these sizes are now being made for local consumption. Jobbers quote small lots at 3.35c. to 3.45c, for No. 27 Black, and 70 and 5 for Galvanized.

Old Metals.—The demand is urgent for all kinds of Scrap Iron, and prices have again stiffened. Scrap Metals in general are active and firmer, especially in the line of Old Brass and Copper. Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper	per lb. 11¼c.
Light and Tinned Copper	per lb. 10 c.
Heavy Brass	per lb. 8¾c.
Light Brass	per lb. 6¼c.
Lead	per lb. 3¾c.
Tea Lead	per lb. 3⅜c.
Zinc	per lb. 3 c.
Pure Aluminum Sheet	per lb. 25 c.
Cast Aluminum	per lb. 20 c.
No. 1 Pewter	per lb. 15¾c.
No. 2 Pewter	per lb. 9 c.
Tin Plate Scrap, per gross ton	to $5.00
Wrought Iron Scrap, per gross ton	$13.50 to 14.00
Heavy Cast Scrap, per gross ton	12.50 to 13.00
Stove Plate Scrap, per gross ton	9.50 to 10.00
Burnt Iron, per gross ton	7.50 to 8.00

THE PIG IRON MARKET.

NEW YORK.—The conspicuous feature of the market is the scarcity of spot Iron, and in some instances fancy prices have been paid. There have not been any sales of special magnitude during the week. Northern furnaces have further advanced prices. We quote for Northern Irons: No. 1, $19 to $19.50; No. 2 X, $18 to $18.25; No. 2 Plain, $17.50 to $17.75; Tennessee and Ala-

bama brands, No. 1 Foundry, $16.75 to $17; No. 2 Foundry, $16.25 to $16.75; No. 1 Soft, $16.75 to $17; No. 2 Soft, $16.25 to $16.50; No. 3 Foundry, $15.50 to $15.75; No. 4 Foundry, $15 to $15.50.

CHICAGO.—Transactions for the week have run to special grades and qualities rather than ordinary common Foundry Iron. Business in Foundry Iron has not been light for lack of inquiry, but because the furnace companies appear to have deelded upon a waiting polley, having a great deal of business booked for forward delivery, and they are inclined to wait until the outlook becomes more definitely settled. A sharp demand exists for spot Iron, caused by the slow deliveries now being made on contracts. Sales of Northern No. 2 Foundry Iron are being made at $18.50 and No. 2 Soft Southern at the same price. Our quotations are nominal to some extent, but especially on Southern Iron. The leading Southern produeers have not advanced their schedule of prices, but it is understood that practically nothing is available except at prices $1 or $2 per ton higher. We quote as follows:

Lake Superior Charcoal	$20.50 to $21.50
Local Coke Foundry, No. 1	18.50 to 19.00
Local Coke Foundry, No. 2	18.00 to 18.50
Local Coke Foundry, No. 3	17.50 to 18.00
Local Scotch, No. 1	18.50 to 19.00
Ohio Strong Softeners, No. 1	19.60 to 20.00
Southern Silvery, according to Silicon.	16.90 to 17.15
Southern Coke, No. 1	16.40 to 16.65
Southern Coke, No. 2	15.65 to 15.90
Southern Coke, No. 3	15.15 to 15.40
Southern Coke, No. 1 Soft	16.40 to 16.65
Southern Coke, No. 2 Soft	15.65 to 15.90

PHILADELPHIA.—Sales have been on a small scale, in view of the unusual feeling of anxlety whieh the trade are experieneing. Makers are not inclined to book any more orders for future delivories at their nominal prices, and consumers are equally unwilling to pay advances. For early delivery almost any price will be paid to tide over the next two or three weeks. Prices, therefore, are entirely problematieal and it is almost impossible to quote them with anything like accuracy. The few sales at whieh actual figures have been given were at $18.75 to $19.25 for No. 2 X Foundry, deliveries to commence in Mareh and continue to July. For the present the range would be about as follows for city and nearby deliveries:

	Deliveries to July.	Deliveries July to December.
No. 1 X, Foundry	$19.25 to $20.00	$18.50 to $19.00
No. 2 X, Foundry	18.75 to 19.25	17.00 to 17.50
No. 2, Plain	18.00 to 18.50	16.50 to 17.00

PITTSBURGH.—The Pig Iron market is in that condition that it is not a matter of prices, but where to get the metal. The furnaces are praetleally sold up to October and spare Iron is bringing almost any price the seller eares to ask. The Foundry Iron market is impossible to quote. For the second half of the year Northern No. 2 is $17 to $17.50, but sales of No. 2 for prompt shipment have been made at much higher prices. The leading Southern produeers are holding No. 2 Foundry at $12, Birmingham, and the freight rate is $4.15, whieh makes prices on these Irons $16.15 delivered at Pittsburgh. However, the Southern produeers are sold up and are therefore unable to quote for early delivery. It is pretty certain that prices of Pig Iron will be higher, although it is recognized that prices are quite high enough now to give the furnaces a very handsome profit.

CINCINNATI.—The general characterlstics of the Pig Iron market are practically what they were a week ago, and the probabilities of a very material change in conditions are small for the immediate future. The ideas of furnaces as regards prices are widely separated and values are estimated to range from $12 to $13.50, Birmingham, for No. 2 Foundry. Trading is very quiet just now, to the evident satisfaction of the majority of selling interests. Quite a number of furnaces have withdrawn from the market, chiefly on account of the difficulties in delivery of stock already sold. Some furnaces are asking above the quotations given herewith, and they may be and likely are doing some selling at higher figures, especially for nearby delivery, but nevertheless prices given below fairly represent the market. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$15.25 to $15.75
Southern Coke, No. 2	14.75 to 15.25
Southern Coke, No. 3	14.25 to 14.75
Southern Coke, No. 4	13.75 to 14.25
Southern Coke, No. 1 Soft	15.25 to 15.75
Southern Coke, No. 2 Soft	14.75 to 15.25
Southern Coke, Gray Forge	13.75 to 14.25
Southern Coke, Mottled	13.75 to 14.25
Ohio Silvery, No. 1	18.00 to 18.50
Ohio Silvery, No. 2	17.50 to 18.00
Lake Superior Coke, No. 1	18.35 to 18.60
Lake Superior Coke, No. 2	17.85 to 18.10
Lake Superior Coke, No. 3	17.35 to 17.85

CHICAGO REPORT.

Scrap Iron and Steel.—Everything in the line of Old Iron and Steel ean be readily sold. We quote dealers' buying prices for carloads lots, Chicago delivery, as follows:

	Per net ton.
Country Wrought Scrap	$14.00 to $14.50
Machinery Cast	13.00 to 13.50
Malleable Cast	12.00 to 12.50
Stove Plate (free from burnt)	10.00 to 10.50
Burnt Iron and Grate Bars	8.00 to 8.50
Sheet Iron and Hoops	8.00 to 8.50
Plow Steel	11.50 to 12.00
Breaking Stock	.... to 11.00
Old Boilers—whole (Iron)	9.50 to 10.00
Old Boilers (Iron) cut in single Sheets and Rings	12.00 to 12.50
Old Gas Pipes and Boiler Tubes	12.00 to 12.50
Cast Borings	7.00 to 7.50
Turnings	11.50 to 12.00
Horseshoes	14.00 to 14.50

Old Metals.—The demand is good, the trade has adjusted itself to the new conditions, and consumers are freely buying to cover their wants. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	11½c.
Copper Bottoms	10½c.
Copper Clips	11 c.
Red Brass	12 c.
Yellow Brass	8 c.
Red Brass Borings	9 c.
Yellow Brass Borings	7¼c.
Light Brass	7 c.
Pipe Lead	3.87½c.
Tea Lead	3.35c.
Zinc	3 c.
Tin Foil	19 c.
Pewter, No. 1	16 c.
Pewter, No. 2	10 c.
Aluminum	20 c.

Old Rubber.—Quite a demand for Rubber Shoes sprung up about the first of the month, and prices advaneed to 7½c., but this brought out a flood of offerings and the price speedily reeeded. As the usual spring collection will soon begin, prices are expected to continue low. Dealers' buying prices are as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	42.50	.....
Rubber Shoes	....	6¾c.
Rubber Car Springs	....	5 c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6½c.
Black Rubber	....	4 c.
White Rubber	....	8¼c.

Rags.—Holders of Rags awaiting an advanee have had their hopes blasted. As spring is now at hand, and new collections will soon be in, they are falling over each other trying to dispose of their stocks and prices are declining. Dealers quote buying prices of good Country Mixed Rags, Chicago delivery, at 70 to 75c. per 100 lbs. in any quantity.

Anthracite Coal.—Balmy weather has caused the market to be very quiet. Prices are unchanged, as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis.	5.75	6.00
St. Louis	6.20	6.45
Kansas City, Mo	8.25	8.50

THE HARDWARE TRADE.

Business continues to feel to some extent the effect of the inclement weather which recently prevailed over so large a portion of the country, but the interruption is apparently unimportant, and business is characterized by an excellent volume and a cheerful tone. Interference with the production of goods, as plants were stopped or injured by the freshets, is perhaps the most serious effect which the trade still feels. Merchants generally are so thoroughly convinced that they will enjoy a heavy demand for seasonable and other goods this spring that they are not only purchasing for immediate shipment, but are placing orders for future delivery. Many jobbing houses find, in fact, that the trade is so active that it is difficult to give orders as prompt shipment as they de-

sire. In several lines it is evident that there will be a scarcity during the season, and even now such goods as Screen Wire Cloth and Poultry Netting are becoming difficult to obtain from the manufacturers, most of whom have sold nearly, if not all, their season's output. In this and similar conditions which prevail in many lines there is obviously no necessity for jobbers to cut prices as liberally as they often have done, an opportunity being afforded of realizing a full margin of profit. In several lines advances have recently taken place, indicating in a general way the strength of the market. Heavy Hardware jobbers in the West report the demand for iron and steel and the various lines they carry as very heavy, and in some cases in excess of anything previously experienced.

NOTES ON PRICES.

Malleable Fittings.—The manufacturers of Malleable Fittings of all kinds and sizes withdrew prices on the 11th inst., and immediately quoted new discounts which advanced these goods 10 per cent. over previously prevailing prices. It is said that all the plants manufacturing Malleable Fittings are still behind in the delivery of last year's orders, and that it will be impossible for them to complete their last year's business before May 1. It is owing to these conditions that an advance has been made. Malleables in lots up to 500 pounds are now quoted to the trade at 50 per cent. discount, and, if the present conditions continue much longer, there is a likelihood that they will go still higher.

Radiators.—On March 10 the A. A. Griffing Iron Company, Jersey City, N. J., advanced all prices on Radiators. The new prices are practically 10 per cent. higher than those previously quoted. It is understood that these prices will not prevail very long, and that the continued advance in Pig Iron will necessitate another revision of prices in the very near future.

Cast Iron Soil Pipe and Fittings.—The manufacturers of Cast Iron Soil Pipe and Fittings, it is rumored, are contemplating another advance in prices. It is said that the scarcity of Pig Iron has had more to do with the price of Cast Iron than the recent advances in Pig Iron have had. It is understood that all of the Cast Iron Pipe plants are pretty well covered for their Pig Iron wants, but that deliveries are not at all adequate to the demands made of the foundries, and, as a result, a stringency in Cast Iron Soil Pipe and Fittings gives the manufacturers an opportunity to make increased profits on their limited product. The trade need not be surprised at any movement in the market. At the present time opinions are more or less unbalanced. The conservative element among the manufacturers is not favorable to an advance, whereas the radical, opportunist element is anxious to make all the money possible out of the present conditions. None of the manufacturers of Cast Iron Soil Pipe and Fittings are outside of the Manufacturers' Association, and all of them are credited with making a fair profit on their product; but the majority of the manufacturers seem to think that the present is a very inopportune time to make another advance, for coming, as it would, upon the heels of the last change, they believe that it would breed considerable hostility among the jobbers; at least that seems to be the opinion of some of the leading jobbers hereabouts.

Solder.—The sharp advance in Pig Tin has been followed by higher prices for Solder. Jobbers are now quoting small lots of Half and Half, guaranteed, at 17½c. to 18c. per lb., and No. 7 at 15c. to 16½c.

Wire Cloth and Poultry Netting.—The market for Wire Cloth and Poultry Netting is decidedly firm, and has an upward tendency. This is owing more especially to the fact that the manufacturers have sold practically their entire product for the season. Under these conditions, with the excellent demand which exists and the prospect for heavy business during the next few months, there is little doubt that a scarcity in these lines will be developed.

The American Wringer Company.—In connection with the issuing of their new catalogue, the American Wringer Company, 99 Chambers street, New York, are sending out a new price-list giving net prices on their entire line. As representative of the goods of the company we give the following prices on their leading machines most generally carried in stock by the trade throughout the country. These prices apply to case lots, which will be delivered f.o.b. on cars in Woonsocket, R. I.; Auburn, N. Y.; New York City, and Chicago; terms 60 days, with 2 per cent. discount for cash in 10 days and 1 per cent. for cash in 30 days:

Royal.

Size of Rolls.		Size of Rolls.	
10 x 1¾	$26.00	10 x 1⅞	$30.00
11 x 1¾	30.00	11 x 1⅞	35.00
12 x 1¾	34.00	12 x 1⅞	40.00

Universal, Novelty and Keystone.

10 x 1¾	$21.00	10 x 1⅞	$24.50
11 x 1¾	24.50	11 x 1⅞	29.00
12 x 1¾	28.00	12 x 1⅞	33.50

Empire.

10 x 1¾	$24.00	11 x 1⅞	$32.00
11 x 1¾	27.50	12 x 1⅞	37.00
12 x 1¾	32.00	12 x 1⅞	48.00

Imperial, Columbia.

10 x 1¾	$18.00	10 x 1⅞	$21.00
11 x 1¾	21.00	11 x 1⅞	24.75
12 x 1¾	24.00	12 x 1⅞	28.50

Eureka, Superior and Gem.

10 x 1¾	$18.00
11 x 1¾	21.00
12 x 1¾	24.00

Rival and Household.

10 x 1¾	$16.00	10 x 1⅞	$18.50
11 x 1¾	18.50	11 x 1⅞	21.75
12 x 1¾	21.00	12 x 1⅞	25.00

Princeton, Idcal and Crescent.

10 x 1¾	$16.00
11 x 1¾	18.50
12 x 1¾	21.00

Daisy.

10 x 1¾	$15.00
11 x 1¾	17.50
12 x 1¾	20.00

Nuts.—An advance was made by the manufacturers on the 25th ult. in the prices of Cold Punched and Hot Pressed Nuts.

Sash Weights.—A meeting of Sash Weight manufacturers from all parts of the United States was recently held at Cincinnati, at which the National Sash Weight Makers' Association was organized. At this meeting a scale of prices was adopted for different sections of the country, according to the local prices of raw material and cost of manufacture. The officers of the association elected for 1902 are as follows: President, Martin Andrews, King & Andrews, Chicago; vice-president, E. E. Brown, E. E. Brown & Co., Philadelphia; secretary and treasurer, J. C. Brainard, Johnston & Jennings, Cleveland. Executive Committee: N. S. Calhoun, Cleveland; J. E. Price, Chattanooga, Tenn.; Ewald Over, Indianapolis; B. H. Frey, Waterbury, Conn.; Martin Andrews, Chicago; E. E. Brown, Philadelphia; J. C. Brainard, Cleveland. The manufacturers are working together in harmony and the market has a firm tone with somewhat higher prices.

Wire Nails.—Owing to the floods shipments of Wire Nails from mills have been seriously interfered with. Some of the mills have been damaged by water to such an extent that a week or two will be required before operations can be resumed. The empty kegs have been washed away and the stock of Nails on hand will have to be retumbled. These conditions are keenly felt at the present time, when many purchasers are anxiously awaiting deliveries of Nails. Stocks of Wire Nails in the hands of New York jobbers are now badly broken in assortment, owing to delayed deliveries from mills. The market is very firm, small lots from store being quoted at $2.25 to $2.30 per keg.

Cut Nails.—The advance of 5 cents per keg on Cut Nails, noted last week, is firmly maintained. As a rule the New York jobbers have not large stocks on hand. Small lots from store are quoted at $2.25 per keg.

Window Glass.—The Window Glass market is devoid of new developments. There is very little Glass used at this season, and buyers do not seem disposed to anticipate their requirements to any great extent. It is rumored that the Jobbers' Association contemplate making a slight advance in the price of Window Glass, with a view of stimulating the demand.

White Lead.—The prospect of spring business in White Lead in Oil is encouraging and an increased inquiry is reported. Quotations are firmly held at 6½

cents per pound for lots of less than 500 pounds, and 6¾ cents for small quantities.

Linseed Oil.—The unsettled weather has not been conducive to the distribution of Linseed Oil. Many of the large buyers are said to have their requirements covered for some months to come. It is anticipated, however, that with improved weather conditions the demand will improve. The market is firm at former quotations, City Raw in small lots being quoted at about 64 cents per gallon, and out of town Raw at 63 cents.

Spirits Turpentine.—Reports of a firm and advancing market in the South have stiffened prices at this point. The demand, however, is only moderate. Small lots of Turpentine are quoted at 46 to 46½ cents per gallon.

The Illinois Metal Company.

The Illinois Metal Company, located at Granite City, Ill., who organized about one year ago, are reported to have grown rapidly and the company are now preparing to increase the facilities for their output of babbitt metal, solder, bar lead, bar tin, &c. It is said that their babbitt metals are in use in many large foundries and rolling mills, and the constantly increasing volume of orders for the various kinds of metal which they manufacture is substantial proof of its favor in the trade. A large part of their product is shipped to the St. Louis market, which is near at hand, but the company are also building up a substantial trade throughout the country. They are sending out circulars with full information concerning their products, and will be pleased to forward the same to any interested parties. M. F. Niedringhaus is president and E. H. Niedringhaus is secretary and treasurer of this company.

Peerless Aluminum Enamel.

Nickel Plate Stove Polish Company, Chicago, Ill., are directing attention to their Peerless aluminum enamel. As aluminum enamel is now in great request for use on exposed plumbing, radiators, screens, railings, stove trimmings and a host of other articles, the company have brought out their own preparation for the purpose. It can be used on any surface on which a bright enamel finish with frosted silver effects is desired. It needs no polishing, and may be washed the same as nickel. It is stated that, being moisture proof, and preventing rust and decay, it is of great value for exposed metal work. It can also be applied to articles made of canvas and leather.

A Heat Indicating Paint.

Users of machinery, says the London *Ironmonger*, will be glad to hear that a paint composition has been invented by a German chemist which will indicate visibly the heating of any particular portion of the metal work. This paint is composed of iodide of mercury and iodide of copper amalgamated in equal quantities and made into a paste by the addition of distilled water. It is painted upon the surfaces of portions of the machinery liable to heat. When cool the paint remains red; but as soon as it reaches a temperature of 140 degrees F. it turns black. On cooling down again it once more returns to its original red color.

Bed Warmers.

During the recent cold spell there developed, according to a contemporary, a considerable demand for electric bed warmers. This apparatus consists of a coil of wire hermetically sealed in asbestos. Through the coil an electric current is passed either from a direct live wire or from a storage battery, thus heating the surrounding asbestos. The machine is nothing less than a stove. It can be used either under the sleeping couch or between the coverlets, and is a great advance over the old hot water bag heating method.

For country use the Japanese stove is popular. This gives the same results as the electric stove, but differs in its mode of accumulating heat. The Japanese article is literally a smoldering fire after the punk or charcoal inside is lit at both ends. There are no fumes or smoke emitted. The Japanese bed warmer is much lower in price than the electric, and may be found as cheap as 10 cents, although this small size is called a hand warmer, and is carried in the pocket. Hospital authorities, it is said, are experimenting with these bed warmers with a view of getting something practical to warm the beds of ambulances.

The newly elected Board of Directors of the Chamber of Commerce of Pittsburgh have appointed a committee of five members to take up the project of a greater Pittsburgh. The scheme is to consolidate Pittsburgh, Allegheny and surrounding boroughs, including McKeesport, Braddock and other large places, which would give Pittsburgh a population of nearly 2,000,000. If the project goes through on the scale proposed it would make Pittsburgh the third city in the Union in population.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED MARCH 14, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ D. 87¢
100-D lots.....₩ D. 35¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 Ds or more.

	6-in.	14-in.	24-in.
Wider than.....	14-in	24-in.	30-in.
And including.....	₩ D.	₩ D.	₩ D.
Nos. 13 to 19.....	$0.42	$0.44	$0.47
" 20.....	.44	.46	.49
" 21 to 23	.46	.48	.51
" 24.....	.48	.50	.53
" 25.....	.47	.51	.54
" 26.....	.47	.54	.59
" 27.....	.48	.57	.62
" 28.....	.48	.57	.64
" 29...	.49	.60	.69
" 30.....	.50	.64	.77

Note.—Lots of less than 50 Ds 5¢ ₩ D extra.

Antimony—

Cookson.....₩ D. 10¼@10¾¢
Hallett's.....₩ D. 8¾@8¾¢
U. S.....₩ D 8½@8¾¢

Brass, Roll and Sheet..... 30%

Conductors—
Corrugated.
Round or Square.—

Galvanized ½ or more, N'st'd.....70&5%
" Not Nested.....70&2½%
" Plain Round, ½ or more, Nested.....70&5%
Galvanized, Plain Round, Not Nested. 70&2½%

Spiral Riveted.

Galvanized.....40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—
See *Strainers, Conductor*

Copper—

Lake Ingot..... ...13¾@14 ¢
Casting.....13½@13¾¢
Sheet and Bolt.....18¢ ₩ D basis
Cold Rolled Sheets.....19¢ ₩ D basis
Cold Rolled and Polished Sheets ..... 20¢ basis
Planished Sheets.....21¢ basis
Bottoms, Pits and Flats....₩ D 22¢ basis

Eave Trough Galvanized

Territory.	L. C. L.
Eastern.....	75&10%
Central.....	75&7½%
Southern.....	70&12½%
S. Western.....	70&10%

Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—
Eastern List.

Tin.....30%
Galvanized.....80%
Perfect Elbows.....40%

Stove Pipe—

Four-Piece

	4	4½	5	5½	6-inch.
No. 1.	$0.80	.85	.90	1.00	1.05 per doz.
No. 2.	.65	.70	.75	.80	.85 "
No. 3.	.60	.63	.65	.70	.80 "

Elbows and Shoes—

Galvanized.....60%

Gasoline—
See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, C. R., Soft Steel.	R. G. Cleaned.
Nos. 14 to 16....	₩ D. 3.60....	3.65¢
Nos. 18 to 21....	₩ D. 3.70....	3.75¢
Nos. 22 to 24....	₩ D. 3.80....	3.85¢
Nos. 25 and 26...	₩ D. 3.90....	3.95¢
No. 27	₩ D. 4.00....	4.05¢
No. 28	₩ D. 4.10....	4.15¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ D 11@14 ¢
Do. Stained..... 6@10½¢
Patent Planished, ₩ D A, 12¢; B, 11¢ net

Galvanized.

Nos. 10 to 16.....	₩ D, 12¢	67½&5@70% off
Nos. 17 to 21.	₩ D, 13¢	
Nos. 22 to 24.....	₩ D, 14¢	
Nos. 25 to 26.....	₩ D, 15¢	
No. 27.....	₩ D, 16¢	
No. 28.....	₩ D, 17¢	
No. 29.....	₩ D, 19¢	
No. 30.....	₩ D, 21¢	

36 in. 1¢ ₩ D higher.

Lead—

American Pig.....4.45@4½¢
Bar.....5@5½¢
Pipe.....6½¢.....20% off
Tin Lined Pipe.....12½¢.....20% off
Block Tin Pipe.....35 ¢.....20% off
Sheet Lead.....7¼¢.....20% off
Old Lead in exchange, 3¼¢ ₩ D.

Mitres, Eave Trough—
See *Eave Trough Mitres.*

Nickel—

Per D.....55@60¢

Paints, Oils, &c.—
Leads—

Lead, American White, in Oil:
Lots of 500 D or over.....6¼ @ 6½
Lots less than 500 D.....6½ @ 6¾
Lead, White, in oil, 25 D tin pails, add to keg price..... @ ¼
Lead, White, in oil, 12½ D tin pails, add to keg price..... @ 1
Lead, White, in oil, 1 to 5 D assorted tins, add to keg price... @ 1½
Lead, White, Dry in bbls.....6¾ @ 6
Lead, Red, bbls., ½ bbls. and kegs:
Lots 500 D or over..... @ 6
Lots less than 500 D ..... @ 6½

Oils—

Linseed, City, raw.....₩ gal..... 64¢
Linseed, City, boiled..... 66¢
Linseed State and West'n, raw..... 63¢

Spirits Turpentine—

In Southern bbls.....46 @46½¢
In machine bbls.....47 @47½¢

Putty—

In bulk.....$1.25
In bladders..... 2.25
In cans 12 D to 25 D..... 2.25
In cans 1 D to 5 D..... 3.25

Petroleum Products—
In Barrels (Barrel Included)

Stove Gasoline..... ...₩ gal. 10½@11¢
Kerosene..... ... ₩ gal. 12@13¢

Pipe, Drain..... ....40%

Pipe, Spiral—
See *Conductors.*

Registers—
List Sept. 2, 1901.

Black Japanned.. .....60&10@60&10&5%
White Japanned.....60&10@60&10&5%
Nickel Plated.....60&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze..... 60&10@60&10&5%
Electroplated in Brass, Bronze or Copper..... ...60&10@60&10&5%
White Porcelain..... .....60%
Solid Brass and Bronze Metal.....50%

Roofing Material—

1 Ply Tarred Paper. ₩ ton.$30.00@31.00
2 Ply Tarred Paper...₩ roll, 108 sq. ft. 50@55¢
3 Ply Tarred Paper..₩ roll, 108 sq. ft. 70@75¢
Slater's Felt.....roll 500 sq. ft., 50@60¢
Roofing Pitch.....₩ bbl. $2 35

Rosin—

Common and Good—Strained.

Rosin, C. & D....	₩ bbl. $1.55	@$1.60
Rosin, E. & F....	₩ bbl. 1.60	@ 1.65
Rosin, G. & H	₩ bbl. 1.70	@ 1.75
Rosin, I. & K. ...	₩ bbl. 1.95	@ 2.00
Rosin, M. & N....	₩ bbl. 3.00	@ 3.60

Shoes and Elbows—
See *Elbows and Shoes.*

Slate Roofing—
f. o. b. cars, Quarry Station.

	According to size.
Pennsylvania:	
Best Bangor, ₩ sqr.	$3.25@$4.50
No. 1 Bangor Ribbon, ₩ sq	3.00@ 3.50
Pen Argyle, ₩ sqr.....	3.00@ 3.75
Peach Bottom, ₩ sqr.....	4.85@ 5.60
No. 1 Boys, ₩ sqr.....	3.35@ 3.55
No 1 Chapman Keystone, ₩ sqr	3.25@ 4.25
Vermont:	
Sea Green, ₩ sqr.....	$2.00@$3.25
Purple, ₩ sqr.....	3.75@ 4.25
Unfading Green, ₩ sqr...	3.25@ 4.50
Red, ₩ sqr	7.00@11.00
Maine:	
Brownville, Unfading Black,	
No. 1 quality.....	$5.25@7.50
No. 2 quality.....	$4.25@6.00

Solder—

½&½ guaranteed..... ..... 17½@18¢
No. 1..... .....15@16½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	—Per Pound.— Barrels	Smaller Q'ntities
Concentrated Flux.....	4c	5c
Eureka Flux:		
Triple Strength.....	3c	3½c
Extra Concentrated.....	4½c	5c
Crystal.....	..	7c
Gedney's Fluid.....	2c	2c
Lennox Fluid.....	2c	3c
Perfection Flux.....	3c	3½@4c
Yager's Salts, 1 lb. bottles.....		each, 50¢
5 lb. bottles, per lb., 45¢		

Soldering Coppers—

Per D..... ..... 20@22¢

Spelter—

Western Spelter.. .....4.60@4.70¢

Spiral Pipe—
See *Conductors.*

Stove Pipe Elbows—
See *Elbows, Stove Pipe.*

Stove Trucks—
See *Trucks, Stove.*

Strainers, Conductor—

Galvanized..... . . ..50%

Tin Pigs and Bars—

Banca, pigs, ₩ D..... .....27½@28 ¢
Straits, pigs, ₩ D..... 27½@28 ¢
Straits, in bars, ₩ D..... .....28½@29 ¢

Tin Plates, American
Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:

IC,	14 x 20.....	....$7.50
IX,	14 x 20....	9.00
IXX,	14 x 20.....	.....10.25
IXXX.	14 x 20.....	.....11.50
IXXXX.	14 x 20.....	.....12.75

Melyn Grade:

IC,	14 x 20.....	7.00
IX,	14 x 20.....	8.50
IXX,	14 x 20.....	9.75
IXXX.	14 x 20	...11.00
IXXXX	14 x 20	.....12.25

Allaway Grade:

IC,	14 x 20.....	6.50
IX,	14 x 20	7.60
IXX,	14 x 20.....	8.70
IXXX,	14 x 20..... .	9.80
IXXXX,	14 x 20.	.....10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC, 14 x 20.....	$4.90@5.00
"	IX, 14 x 20.....	$6.00

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 D.....	15¢
95 D.....	20¢
90 D.....	25¢
85 D.....	30¢

Terne Plates—

N. B.—The following prices are for 10 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance for 8 to 10 D coating and $2.50 to $3 advance for 15 D and upward.

About 40 D coating..	$16.00@16.50
About 30 D coating.....	15.25@15.75
About 20 D coating.....	13.25@13.75
About 15 D coating.....	11.25@11.75
About 8 D coating.....	.....@10.00

Boiler Plates, American—

IXX, 14 x 26..(112 sheets).....	$12.50
IXX, 14 x 28..(112 sheets).....	13.50
IXX, 14 x 31..(112 sheets).....	15.00

Troughs, Eave—
See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubes and Tubing—

Brazed Brass, List June 6, 1898 .....40%
Copper and Bronze, 3c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb 4 1899
Tin.....50%
Galvanized.....50%
Fittings for do.....40%

Zinc—

600 D casks ₩ D.....6¾¢
Per D.....7¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
80 gal.....70&10%
85 and 40 gal.....70%
Other sizes up to 52 gal....60@60&10%
52 gal. and above..... .....60%
Extra Heavy Boilers:
18 to 52 gal.....60%
53 gal. and above 55%

Brass Work, Plumbers'—
List of December 7, 1896.

Compression:
Basin Cocks.....65%
Bath Cocks and Double Bath Cocks.. 65%
Bibs. 65%
Bibs, Flanged.....65%
Fuller:
Bibs..... .....70%
Basin Cocks Nos. 1 to 4..... ....70%
Bath Cocks, No. 4½.....$2.40 each net
Ground Key Work:
Finished Bibs..... .....55&5%
Rough Bibs..... 70%
Rough Stop and Stop and Waste Cocks.....70@70&5%
Rough Stop and Stop and Waste Cocks, Patented..... ..... 65@65&5%

Miscellaneous—

Basin Clamps.....60@65%
Basin Plugs.....60@65%
Chain Stays. . ...60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face, ₩ set	$0.95	$1.05
Ground Face ₩ set	1.00	1.10

Sink or Bath and Wash Tray Plugs.60@65%
Soldering Nipples.....70&5@75%
Soldering Unions.....70&5@75%
Union Elbows, Hot Water Heating.... 75@75&15%

Cocks, Valves, &c.—
Cocks—
Brass—

Air and Radiator Air .....75@75&5%
Gas Meter and Union Meter.....65@70%
Steam.....65@70%

Iron—

All Iron.....70@70&10%
Iron with Brass Plugs.....65@70%

Valves—
Brass—

Check.....65@70%
Garden Hose..... .....65&10@70%
Gate. .....65@65&10%
Globe and Angle, hose outlet.65@65&10%
Globe, Angle and Cross....65&10@70&5%
Horizontal, Vertical and Angle Check... 65@65&10%
Hot Water Radiator 75%
Radiator.....70&10%
Safety.....65%
Safety, Low Pressure.....65%
Jenkins' Disc:
Check... .....65%
Gate.....65%
Globe, Angle and Cross.....70%
Radiator..... .....80%
Radiator, Corner. 75%
Safety.. .....65%

Iron—

Iron Body .....70@70&5%
Foot..... .....65@70%
Jenkins Bros.':
All Iron, except Gate.....40&5%
All Iron Gate..... .....35@40%
Iron Body, except Gate..... .....60%
Iron Body Gate..... .....50@50&5%
Swing Check..... ....50%

Earthenware—

Brown Glazed Wash Tubs..... .....20%
Brown Glazed Sinks, Kitchen and Pantry 20%
Basins, Urinals and Hoppers.....45%
Closet Bowls, Sundries, Washouts and Pedestals..... ... .50%

Fittings—
Brass Fittings—

Finished.....70@75%
Rough .....70@75%
Bushings.....70@75%
Nipples.....70@70&2½%
Unions, Rough and Finished....70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard sizes.. .....65@70%
Cast Iron Bushings and Plugs....65@75%
Cast Iron Flanges.....65@70%
Cast Iron Floor Flanges.....65@75%
Malleable Iron Fittings..... ...70@ 75%
" " Bushings.....70@70&10%
" " Unions.....70&10@75%
" " Unions, Flange 60&10@70%
" " Pipe Hangers, Universal 50%
Wrought Iron Nipples.....70@75%
" " Couplings... .....60@65%
" " Long Screws..... .60@65%

Lavatories—

Porcelain Enameled Iron.....30@30&10%

Oakum—

Plumbers' Oakum, 50 lb. bales, ₩ D 2½¢

Pipe—
Brass, Iron Pipe Size—

⅛	¼	⅜	½ to 3 Inch
$0.38	.34	.29	.23 ₩ D

Cast Iron Soil—
List Feb. 25, 1901.
2 to 6 inch inclusive.

Standard..... 50&10%
Extra Heavy..... .....65%
All Fittings.....70%

Wrought Iron—
List Feb. 15, 1900.

	Black.	Galv.
⅛ to ⅜ inch.....	57%	43%
¾ to 12 inch.....	64%	51%

Radiators—
Standard List.

Steam.....50&2½%
Hot Water..... .....50%

Sinks, Etc.—Cast Iron—

	Black.	Galv
Sinks, Square, Half Round and Corner...	60@65%	60@65%
Sink Legs. 60%		60@65%
Sink Backs 60%		60@65%
Boiler Stands, Cast Iron.....	60@60&10%	
Cesspools, Cast Iron.....	60%	

Wrought Steel Sinks—

New Era, Galv'd and Enameled. ..70&5%
New Era, Painted.....50&10%
L. & G.....50%

Traps—

Drawn Lead Traps, List June 3, 1901..... 50&5%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns, Guaranteed. 45@50%
All Special Patterns..... ...25%
Non-Guaranteed Brands, complete line .....45@50%
Solid Copper, list of Feb. 1, 1899.....40%
Solid Porcelain—Class A, 90%: B, 40% C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899.....50@55%

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Acetylene Gas Burners.
Carroll, J. B., Chicago, Ill.

Acetylene Gas Generators.
International Heater Co., Utica, N. Y.

Agricultural Furnaces.
Giblin & Co., Utica, N. Y.

Aluminum Ingots.
Janney, Steinmetz & Co., Phila., Pa.

Aluminum Scrap Buyers.
Janney, Steinmetz & Co., Phila., Pa.

Aluminum Sheets.
Janney, Steinmetz & Co., Phila., Pa.

Architectural Ornaments.
Edwards Mfg. Co., Covington, Ky.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, O.

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Foster, F. W. Mfg. Co., Boston, Mass.

Bathtubs.
Day Metallic Mfg. Co., Detroit, Mich.

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American Tin Plate Co., New York.
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American Blower Co., Detroit, Mich.

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American Blower Co., Detroit, Mich.

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Berger Bros. Co., Phila., Pa.

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Mueller, L. J. Furnace Co., Milwaukee, Wis.

Boilers, Range.
Koven, L. O. & Bro., 50 Cliff St., N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

Brass Goods
Jenkins Bros., 71 John St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Burners, Acetylene.
Carroll, J. B., Chicago, Ill.

CanMakers' Toolsand Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
Stiles & Parker Press Co., Brooklyn, N. Y.

Ceilings, Metallic.
Berger Mfg. Co., Canton, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Coal Vases.
Cincinnati Stamping Co., Cincinnati, Ohio.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros. Co., Philadelphia, Pa.
Clark, Quien & Morse, Peoria, Ill.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
McClure & Co., Pittsburgh, Pa.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Machine & Tool Works, Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Poorman Mfg. Co., Piqua, O.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Co., Cleveland, O.
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Couplings. (*See Pipe Couplers.*)

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Cooney & Geiger, Indianapolis, Ind.

Dampers
Arcade Mfg. Co., Freeport, Ill.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Curtis & Curtis Co., Bridgeport, Ct.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Dryers.
Sommer's, John Son, Newark, N. J.

Dumb Waiters.
Energy Elevator Co. Phila., Pa

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Reeves Mfg. Co., Canal Dover, O.

Eave Trough Hangers.
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Berger Mfg. Co., Canton, O.

Elbows, Stove Pipe.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

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Scranton Corundum & Emery Wheel Co., Scranton, Pa.

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National Enameling & Stamping Co., 78 Beekman St., N. Y.

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Presbrey Stove Lining Co., Tannton, Mass.
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Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Fire Pots.
Clayton & Lambert Mfg. Co., Detroit, Mich.
Wolff, L. Mfg. Co., Chicago, Ill.

Fire Sets.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Forming Machines.
Pocock, Oliver, Cincinnati, O.

Furnace Cement.
Perkins, J. L. & Co. Chicago.
Rutland Fire Clay Co., Rutland, Vt.

Furnace Pipe and Fittings.
International Heater Co., Utica, N. Y.
Osborn, J. M. & L. A., Cleveland, O.

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Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
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Brien Heater Co., Hoosick Falls, N. Y.
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Giblin & Co., Utica, N. Y.
Hart & Crouse Co., Utica, N. Y.
Hess-Snyder Company, Massillon, Ohio.
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Kelsey Heating Co., Syracuse, N. Y.
Lennox Manufacturing Co., Marshalltown, Iowa.
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Patric Furnace Co., Springfield, O.
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Richmond Stove Co., Norwich, Conn.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Ct.
Stanton Heater Co., Martins Ferry, O.
Thatcher Furnace Co., 240 Water St., N. Y

Gas Heaters. (*See Stoves and Ranges. Gas.*)

Gas Machines.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Granite Steel Ware.
National Enamoling & Stamping Co., 78 Beekman St., N. Y.

Groovers.
Poorman Mfg. Co., Piqua, O.
Wheeler, W. A., Indianapolis, Ind.

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Double Truss Cornice Brake Co., Buffalo, N. Y.

Heaters, Steam and Hot Water.
Barstow Stove Co., Providence, R.I.
Dighton Furnace Co., Taunton, Mass.
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Gorton & Lidgerwood Co., 96 Liberty St., New York.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
International Heater Co., Utica, N. Y.
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Magee Furnace Co., Boston, Mass.
Mueller, L. J. Furnace Co., Milwaukee, Wis.
National Pipe Bending Co., New Haven, Conn.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.
Richmond Stove Co., Norwich, Conn.
Sheppard, Isaac A. & Co., Phila., Pa
Smith, H. B. Co., Westfield, Mass.
Smith & Anthony Co., Boston, Mass.
Smith & Thayer Co., Boston, Mass.
Stolz, Frank D., Chicago, Ill.
Thatcher Furnace Co., 240 Water St., N. Y.
Vance Boiler Works, Geneva, N. Y.
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Smith & Anthony Co., Boston, Mass.

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Clad, V. & Sons, Philadelphia, Pa.
Seavey Mfg. Co., Boston, Mass.

Ice Cream Freezers.
White Mountain Freezer Co., Nashua, N. H.

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Iron, Planished Sheet.
Amer. Sheet Steel Co., New York.

Iron Shutters and Doors.
Garry Iron & Steel Co., Cleveland, O.

Lath, Metallic.
Schratwiesers Metal Lath Works.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

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Washburne, E. G. & Co., 46 Cortlandt St., N. Y

Lunch Boxes.
Seavey Mfg. Co., Boston, Mass.

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Signal Mail Box Co., Joliet, Ill.

Manufacturing Sites.
Chamber of Commeroe, Muskegon, Mich.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Asheville Mica Co., Asheville, N. C.
Munsell, Eugene & Co., 218 Water St., New York.
Ohio Mica Co., Canton, Ohio.
Palermo Mica Co., 115 Beekman St., N. Y.
Rutland Fire Clay Co., Rutland, Vt.

Milk Cans.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Oil Heaters. (*See Stoves and Ranges, Oil, Vapor and Gasoline.*)

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Blodgett, G. S. Co., Burlington, Vt.

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Hamlin, G. R., Washington, D. C.
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Patterns.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Perforated Sheet Metal.
Harrington & King Perforating Co., Chicago, Ill

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

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Curtis & Curtis Co., Bridgeport, Ct.
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Iwan Bros., Streator, Ill.

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Walworth Mfg. Co., Boston, Mass.

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Walworth Mfg. Co., Boston, Mass.
Wolff, L. Mfg. Co., Chicago, Ill.
Young, Jos. H., Boston, Mass.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y

Plyers, Pipe Expanding.
Anderson Coupling Co., Portland, Ct

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Arcade Mfg. Co., Freeport, Ill.
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Troy Nickel Works, Troy, N. Y.

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Kirk Mfg. Co., Toledo, O.

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Gurney Heater Mfg. Co., Boston, Mass.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.

Range Boilers.
Koven, L. O. & Bro., 50 Cliff St., N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

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Frink, I. P., 551 Pearl St., New York.

Refrigerators.
Cooper & McKee, Brooklyn, N. Y.
Gurney Refrigerator Co., Fond du Lac, Wis
Illinois Refrigerator Co., Morrison, Ill.

Registers.
Canton Steel Roofing Co., Canton, O.
Dighton Furnace Co., Taunton, Mass.
Independent Register Co., Cleveland, Ohio.
Seavey Mfg. Co., Boston, Mass.

Roofing, Asphalt.
Asphalt Ready Roofing Co., 186 Water St., N. Y.

Roofing Cement and Paint.
Asphalt Ready Roofing Co., 186 Water St., N. Y.
Callahan, Geo. & Co., 218 Front Street, N. Y.
Dixon, Jos. Cruoible Co., Jersey City, N. J.
Perkins, J. L. & Co., Chicago.
Rutland Fire Clay Co., Rutland, Vt.

Roofing Cork.
Stowell Mfg. Co., Jersey City, N. J.

Roofing Edger.
Danzer Metal Works, Hagerstown, Md.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
Berger Mfg. Co., Canton, O.
Burton, W. J. & Co., Detroit, Mich.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Reeves Mfg. Co., Canal Dover, O.

Roofing Nails.
Salem Nail Co., 279 Pearl St., N. Y.

Roofing Slate.
Auld & Conger Co., Cleveland, O.
Bray, J. & Co., E. Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Genuine Bangor Slate Co., Easton, Pa.
Johnson, E. J. & Co., 38 Park Row, N. Y.
O'Halloran & Jacobs, Pittsburgh, Pa.

Sap Spouts.
Millar, C. & Son Co., Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.

Screens.
Harrington & King Perforating Co., Chicago, Ill.

Sewer Pipe.
Rutland Fire Clay Co., Rutland, Vt

Shaped Iron and Steel, Galvanized.
Am. Galvanizing Wks., Chicago, Ill.

Shears, Sheet Metal
McSherry, Chas., Pittsburgh, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y
Keene Geo. C. & Co., Cincinnati, O.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Pocock, O., Cincinnati, O.
Poorman Mfg. Co., Piqua, O.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
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Sheets, Galvanized.
American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
McCluro & Co., Pittsburgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Alan Co., Philadelphia, Pa.

Sheets, Iron and Steel.
American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
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Wood Co., Alan, Philadelphia, Pa.

Shingles and Tiles, Metallic.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.
Colwell Lead Co., 68 Centre St., N. Y.

Siding. *(See Roofing and Siding.)*

Skylights.
Canton Steel Roofing Co., Canton, O.
Drouve, G. Co., Bridgeport, Conn.
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Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 279 Pearl St., N. Y.

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Clason Arch. Metal Works, Providence, R. I

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Bruce & Cook, 186 to 190 Water St., NY
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

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Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties, Sheet Metal.
Vogel, Wm. & Bros., Brooklyn, N. Y.

Statuary, Sheet Copper and Bronze.
Mullins, W. H., Salem, O.

Steam and Gas Fitters' Supplies.
Curtis & Curtis Co., Bridgeport, Conn
Walworth Mfg. Co., Boston, Mass.

Steam and Water Engineering and Regulating Specialties.
Kieley & Mueller, 7-11 West 13th St., N. Y.

Steel Shapes.
Cambridge Rolling Mill Co., Cambridge, Ohio.

Steel Stamps and Stencil Dies.
Schwerdtle Stamp Co., Bridgeport, Ct.

Stove Bands.
Kirk Mfg. Co., Toledo, O

Stove Cement.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Rutland Fire Clay Co., Rutland, Vt.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass

Stove and Metal Polish.
Hoffman, Geo. W., Indianapolis, Ind
Nickel Plate Stove Polish Co., Chicago, Ill.
Rutland Fire Clay Co., Rutland, Vt.

Stove Patterns.
Cope, G. W., Detroit, Mich.
Gohelle Pattern Co., Cleveland, O.
Milwaukee Pattern Works, Milwaukee, Wis.
Vedder Pattern Works, Troy, N. Y

Stove Pipe Thimbles.
O. K. Mfg. Co, Buffalo, N. Y.

Stove Repairs.
Clark, Henry N. Co., Boston, Mass.
Heath, C. C. & Co., Phila., Pa.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Arcade Mfg. Co., Freeport, Ill.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

Stoves and Ranges.
Barstow Stove Co., Providence, R. I
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Brand Stove Co Milwaukee, Wis.
Champion Steel Range Co., Cleveland, Ohio.
Dighton Furnace Co., Taunton, Mass
Enterprise Stove Co., Vincennes, Ind.
Floyd, Wells & Co., Royersford, Pa.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co., Utica, N. Y.
Hess-Snyder Company, Massillon, O.
Joliet Stove Works, Joliet, Ill.
Magee Furnace Co., Boston, Mass.
Pittsburgh Stove & Range Co., Pittsburgh, Pa.
Quincy Fdry. & Novelty Co., Quincy, Ill.
Richmond Stove Co., Norwich, Conn.
Schneider & Trenkamp Co., Cleveland, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Smith & Anthony Co., Boston, Mass.
Stamford Foundry Co., Stamford, Ct.
Thatcher Furnace Co., 240 Water st., N. Y.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass

Stoves and Ranges, Gas.
Adler, H. & Co., Pittsburgh, Pa.
Dangler Stove & Mfg. Co., Cleveland, Ohio.
Dighton Furnace Co., Taunton, Mass.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.

Stoves and Ranges, Oil, Vapor and Gasoline.
Dangler Stove & Mfg. Co., Cleveland, Ohio.
Heath, C. C. & Co., Philadelphia, Pa.
National Vapor Stove & Mfg. Co. Lorain, O.
Schneider & Trenkamp Co., Cleveland, O

Street Lamps, Gasolene.
Merkel, H., St. Louis, Mo.

Tanks, Steel and Wood.
Edwards, J. H., 59 Park Place, N. Y.

Terne Plates.
American Tin Plate Co., New York.
Taylor, N. & G. Co., Phila., Pa.

Tinners' Tools, Machines and Supplies.
Berger Bros. Co., Phila., Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn N. Y.
Weiss, H. & Co., 20 Cliff St., N. Y

Tinners' Trimmings.
Vogel, Wm. & Bros, Brooklyn, N. Y.

Tin Plate.
American Tin Plate Co., New York.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
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Vulcan Western Co., Streator, Ill.

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Miner & Peck Mfg. Co., New Haven, Ct.

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THE METAL WORKER.

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Original letters of reference should not be inclosed with replies to advertisements appearing in these columns as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

A good TINNER and PLUMBER who understands the business, for a steady job the year round; please send references and state wages wanted, &c. B. S. Magill & Son, Tidioute, Pa. Mar. 15

SHEET IRON MECHANICS who have a knowledge of erecting blow piping; apply, stating age, if married or not, what experience you have had in this line of work and whom you have worked for, and what wages you expect for steady work if you prove satisfactory; we have always had steady work for good men in this line. Apply to Box 428, Hartford, Conn. Mar. 15

A MACHINIST who is thoroughly capable of managing a machine shop where steam and hot water heaters are made; state experience and where, also wages. "Sectional," care *The Metal Worker*, New York. Mar. 15

A first-class TINSMITH; one accustomed to shop work, jobbing, range and furnace work; steady work to reliable, steady man; state wages wanted, &c. F. S. Thompson, Kingston, N. Y. Mar. 15

A first-class PLUMBER and TINSMITH for general work in country shop; must be sober and reliable and have good references; steady job. G. L. Swift's Sons, Marathon, N. Y. Mar. 15

An ASSISTANT SUPERINTENDENT for a foundry making steam and hot water boilers and hot air furnaces and employing about 175 hands; must be thoroughly up to date in all branches connected with such an establishment and not over 35 years of age; to such a party an excellent opportunity for advancement is offered: give reference. "Foundry," care *The Metal Worker*, New York. Mar. 15

One first-class TINSMITH and ROOFER eight-hour day; good wages to right man. Apply to C. S. McLean & Co., Utica, N. Y. Mar. 15

I have an opening for a first-class FOREMAN and CUTTER for cornice and skylight shop; only men of wide experience and capable of handling high class work and a large number of men need apply; must show a successful past record by unquestionable references. "S. T. L.," 506 Renfost Building, Chicago, Ill. Mar. 15

Two good CORNICE and SKYLIGHT MAKERS; come prepared to commence work at once; eight hours per day; $3 per day. Hugh C. Lendrim, 82 and 84 Clay street, Paterson, N. J. Mar. 15

FOREMAN for galvanized iron shop. "X. Z.," care *The Metal Worker*, New York. Mar. 15

A goood TINNER who can do slating and general jobbing; six miles from city of Pittsburgh, Pa.; steady work and good wages for the right man. Geo. S. Graff, Castle Shannon, Pa. Mar. 15

Capable and experienced FOREMAN for large sheet metal working factory; must be able mechanic with executive ability; state experience, references and salary expected "Tinware Specialties," care *The Metal Worker*, New York. Mar. 15

By a large tinware manufacturer, a young man capable of taking charge of a pieced tinware department; practical man with experience preferred. Address applications "P. K.," 89 Sixteenth street, Milwaukee, Wis. Mar. 15

At once, two good CORNICEMEN for inside and outside work; also two SHEET IRON WORKERS; good wages: apply ready for work. Newburgh Cornice Works, Newburgh, N. Y. Mar. 15

No. 1 TINNER, inside and outside; one that can cut patterns, with some knowledge of skylight galvanized iron and hot air furnace work, capable of putting in a job and taking charge of men; must be sober, industrious and up to date; married man preferred; steady first-class job awaits such a man; state wages wanted. Lock Box 227, Wilson, N. C. Mar. 15

TINNERS can secure steady work and good wages from Love & Casselman, Alliance, Ohio. Mar. 15

A good all around TINNER for the South; state ability and wages wanted; steady job. J. E. Michael, Talladega, Ala. Mar. 15

SALESMAN for tin plates, galvanized sheets and roofings for Eastern Pennsylvania, New Jersey, Maryland and Virginia; none but experienced men thoroughly acquainted with the trade need apply. "Salesman," care *The Metal Worker*, New York. Mar. 15

An A1 PLUMBER, STEAM and HOT WATER FITTER; one who can do tin work; must be reliable and sober; to the right man good wages and steady work the year through; send references. P. E. Fraleigh, Red Hook, N. Y. Mar. 15

A SALESMAN familiar with the range and furnace trade in the section nearby New York City; state age and experience. "Manufacturer, 315," care *The Metal Worker*, New York. Mar. 15

A first-class TINSMITH and GENERAL JOBBER; one that understands plumbing preferred; must be sober, honest and a quick and reliable worker; steady work for the right man; reference required. S. A. Teets, 507 Eighth avenue, New York. Mar. 15

A first-class PLUMBER, TIN and SHEET IRON WORKER; hot air, steam and hot water heating; in fact an all around man; must be sober and reliable; steady employment to the right man; state wages. W. A. Smith, Hazardville, Conn. Mar. 15

About May 1, a first-class TINNER who understands plumbing, furnace work and general job work, roofing, spouting, &c., done in a country shop; sober, industrious and reliable married man preferred. Cole's Hardware, Dushore, Pa. Mar. 15

FOREMAN for furnace tin shop employing 20 men; must have experience and furnish references. "K.," care *The Metal Worker*, New York. Mar. 15

A1 PLUMBER, STEAM and HOT WATER FITTER, with some knowledge of tin and sheet iron work; must be steady, sober and reliable; give references, wages wanted; married man preferred; to right man will give steady job. Martin & Kuebler, Viroqua, Wis. Mar. 15

Good, steady man to FOLLOW-BOARD STOVE PATTERNS, also make FLASKS. Indianapolis Stove Company, Indianapolis, Ind. Mar. 1

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By TINSMITH; long experience in tin, brass and copper work; understand tinning and brazing. S. Golomb, 3 Goerck street, New York. Mar. 15

At once, by a first-class STOVE PATTERN FITTER, capable of taking charge of shop; best of references; sober and reliable. Frank Brando, 187 Ontario street, Cleveland, Ohio. Mar. 15

By a married man, at range and furnace work, tin and slate roofing, gutters and leaders, iron piping, pumps and wind mills; steady job; sober and reliable. "P. B.," Box 459, Bellport, L. I., N. Y. Mar. 15

By a PLUMBER, TIN and SHEET IRON WORKER; hot air and hot water heating; general all around man; can estimate and work from plans; references if required. Joseph M. Nangle, 24 Traymore street, North Cambridge, Mass. Mar. 15

By a PRACTICAL PLUMBER and GAS FITTER; city or country. R. S. Sholes, Jr., 11 Hedge avenue, Norwich, Conn. Mar. 15

FOREMAN; a thorough, practical tinsmith and furnaceman, tin and slate roofing; married; 40 years old; 20 years' experience; I would like a steady situation by the year to take charge of shop or tinware factory that is going good work where fine goods are made; I have had experience as foreman. "American," care *The Metal Worker*, New York. Mar. 15

A well-known HARDWARE SALESMAN wants a complete line of stoves to carry as a side line in States of Pennsylvania, West Virginia and Virginia. "W. V.," care *The Metal Worker*, New York. Mar. 15

As DRAFTSMAN or FOREMAN of a modern shop; Western Pennsylvania preferred; have had three years' experience as assistant foreman and draftsman and can follow any kind of sheet iron and metal work; best of references. "D. Z.," care *The Metal Worker*, New York. Mar. 15

By a first-class, all around TIN and SHEET IRON WORKER; 16 years' experience in all branches of trade; would like a position with some good firm; can estimate from drawings; graduate of architectural sheet metal work drawing; marr'ed man; sober and reliable; steady work; city or country; wages moderate. W. H. Hartwick, Kennebunkport, Maine. Mar. 15

By PLUMBER; city or country. Thomas McMahon, 155 West Sixty-second street, New York. Mar. 15

A first-class PLUMBER (licensed) and GAS FITTER, with some knowledge of steam and hot water fitting; can also burn lead with flame; wants steady job; married, 29 years old; strictly sober and reliable; 12 years' experience; good reference. Frank Armeson, 121 County street, Attleboro, Mass. Mar. 15

First-class PLUMBER desires a steady position in country town. "A. S.," 1237 Third avenue, New York. Mar. 15

By first-class PLUMBER; 15 years' experience at pipe fitting and gas fitting, furnace work; wish steady work, city or country; sober, industrious and honest; wages, $2.75 a day; best of references. James Yancer, 531 Grant avenue, Van Nest Park, New York. Mar. 15

By a first-class TIN and SHEET IRON WORKER; estimate from plans and drawings; practical in all branches of tin and sheet iron work; 14 years' experience; open for engagement at once; married man; sober and honest; master mechanic; steady work wanted. Chas. Wood, Sanford, Maine. Mar. 15

FOREMAN with 15 years' experience as mechanical and ornamental draftsman on stoves, ranges and hot air furnaces; steam heating a specialty. "M. O. D.," care *The Metal Worker*, New York. Mar. 15

By first-class PLUMBER; city or country. James Tyler, 321 West Forty-third street, New York. Mar. 15

By TRAVELING SALESMAN acquainted with the metal, tin plate and sheet iron business; salary or commission. "Metallic," care *The Metal Worker*, New York. Mar. 15

By an all around TINNER and FURNACEMAN; have had three years' experience in the business; would like a job in a small Ohio town; can give good reference if needed; don't expect large wages; 20 years of age; sober and reliable. Abe Richardson, 337 East Franklin street, Circleville, Ohio. Mar. 15

First-class PLUMBER desires a steady position in country town. "J. P.," 97 Concord street, Brooklyn, N. Y. Mar. 15

As FOREMAN on railroad in the tinning and heating departments; a thorough, practical man; American; 40 years old and married; would like such situation, as I have handled such before and had over 1000 miles of railroad work to care for; the work was on all stations and buildings belonging to road, such as tinning, plumbing, heating and slating. "American," care *The Metal Worker*, New York. Mar. 15

TRAVELING SALESMAN wants position with mill, plumbers' and steam fitters' supply firms; can speak German. "F. G. J.," Box 430, Seymour, Conn. Mar. 15

As PLUMBER and TINSMITH in a country shop, by a first-class mechanic; 15 years' experience in both lines; would like steady position; first-class references. Geo. H. O'Neill, Lock box 14, Thomastown P. O., L. I., N. Y. Mar. 15

By PATTERN FILLER of experience; also knows something of fitting; position desired where he can learn the fitting branch more fully; references. "Pattern Filler," care *The Metal Worker*, 1205 Chemical Building St. Louis, Mo. Mar. 15

By first-class PLUMBER; city or country; 15 years' experience. John Shea, 1331 Third avenue, New York. Mar. 15

By TINNER in some factory or small plant; wages by the day, no piece work; am a practical, neat workman, also a good, safe hand on soldering; steady and reliable. T. Reardon, 1211 Walnut street, Cincinnati, Ohio. Mar. 15

By young man, 21 years old; with some reliable party; can furnish reference and security. T. J. McKenna, 48 Montauk avenue, Brooklyn, N. Y. Mar. 15

By young man as TIN and SHEET IRON WORKER; understands all kinds of inside and outside work; good roofer and general jobber; 12 years' experience in city and country; country town preferred; steady position desired. "F. G.," 24 Shackelford Block, Saratoga Springs, N. Y. Mar. 15

A steady position by a practical PLUMBER and TINSMITH on general jobbing; have had 14 years' experience in business; can clerk, keep books and if necessary handle hands; am sober, honest and energetic; state wages and number hours per day; West preferred. Box 5, Lykens, Pa. Mar. 15

By an experienced foundryman, position as SUPERINTENDENTor general FOREMAN of foundry making stoves, ranges and steam and hot water boilers; have 17 years' experience and can furnish the best of references; understand the most modern cupola practice and can handle help to advantage; capable of taking entire charge of plant manufacturing any of the above goods. "Foundryman," care *The Metal Worker*, New York. Mar. 15

By first-class PLUMBER; jobbing or new work. J. Connelly, 459 West Twenty-seventh street, New York. Mar. 15

PLUMBER; first-class; jobbing or new work. L. McCarthy, 420 West Fifty-sixth street, New York. Mar. 15

As a PLUMBER in the country. Geo. Ed. Conlin, 2342 Old Broadway, between 129th and 130th streets, New York. Mar. 8

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JAMESTOWN, N. Y.

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Pure Tin Scrap, Pure Lead Scrap and Zinc Clippings. Give full particulars quoting best prices. Address

"SCRAP METAL,"
Care *The Metal Worker*, New York.

FOR SALE.

A well established Stove, Furnace, Tin Roofing, and House Furnishing business. Nice clean stock in a Penna. town of 15,000. At a bargain to a quick buyer. Good reason for selling.

Address "HOLDEN,"
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8 ft. Cornice Brake. Robinson make, and in perfect order.

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259 W. 21st St., New York

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To sell rights on a patented article in which there is good profit and for which there is great demand. Sells from $1.50 up; made of galvanized iron; can be made in any good sized tin shop and worked into a good big business. Address

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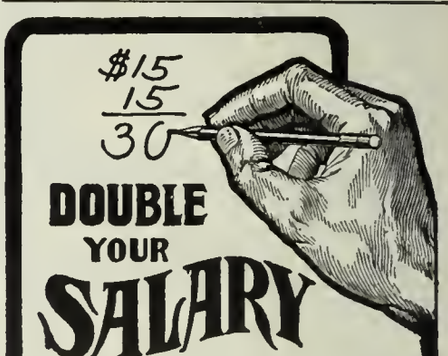
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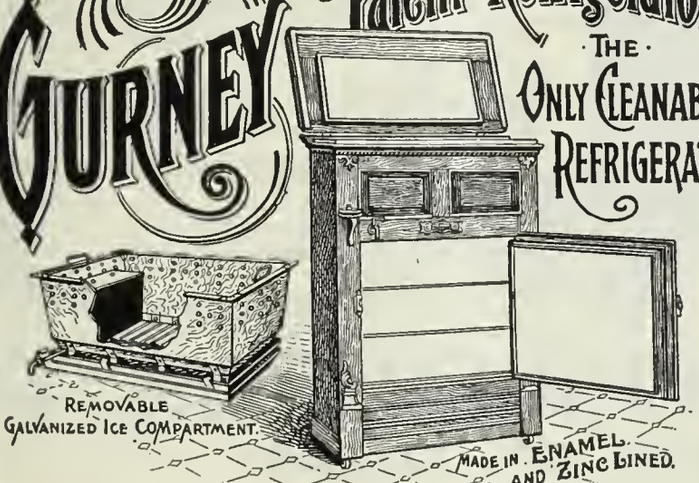
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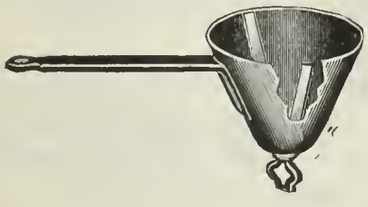
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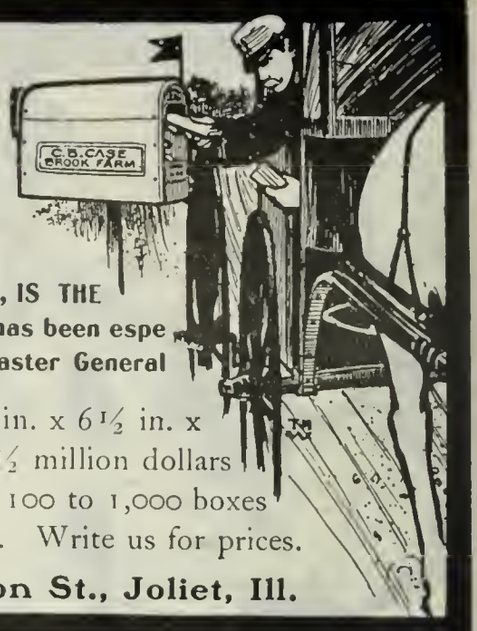
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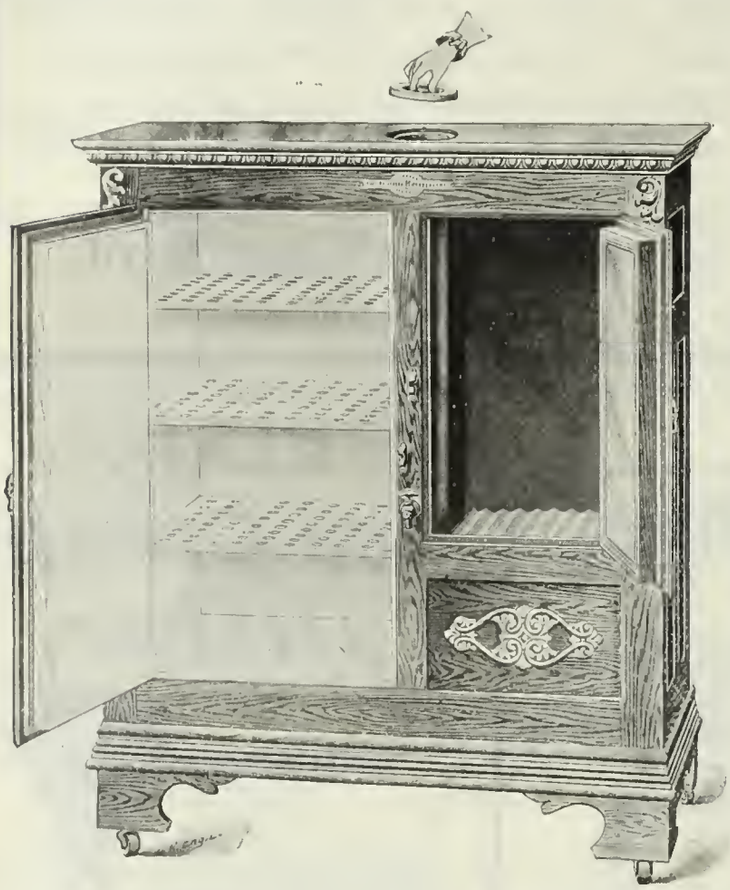
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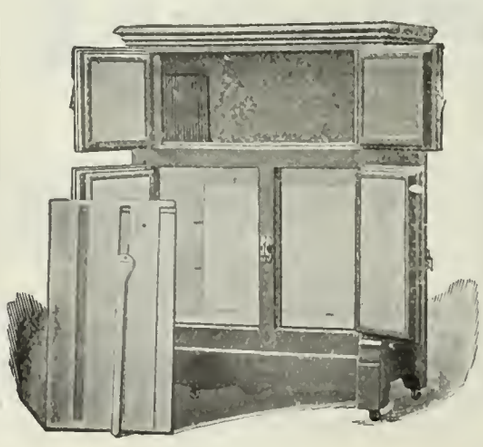
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The Use of a Pyrometer.
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Removing Scale with Sulphuric Acid.
Cleaning Sandy Castings with Sulphuric Acid.
Preparing the Work for Dipping in the Zincing Bath.
Drying the Work.
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Dipping the Work in the Molten Metal.
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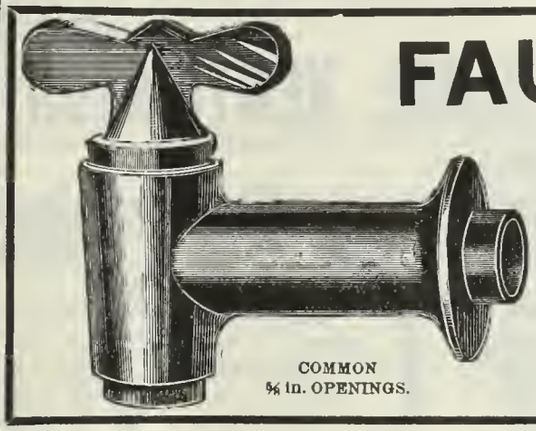
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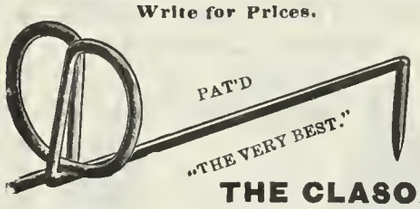
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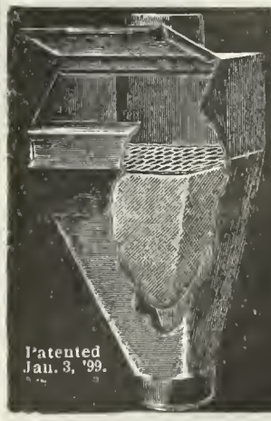


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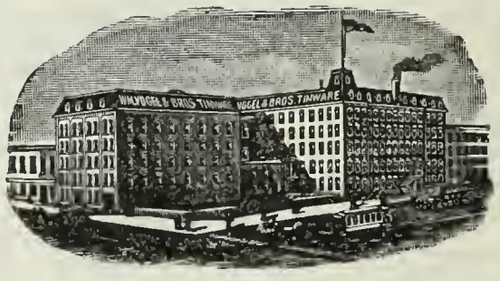
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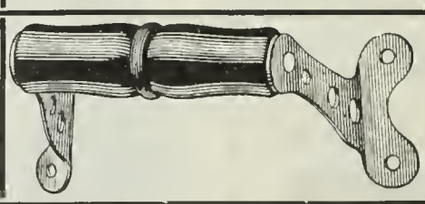
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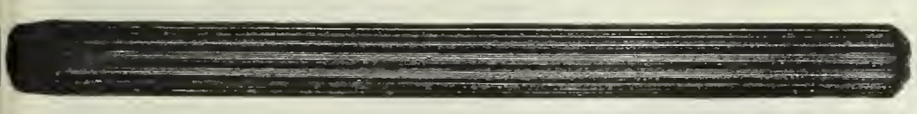
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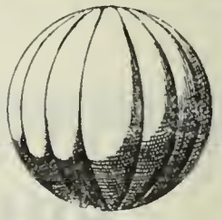
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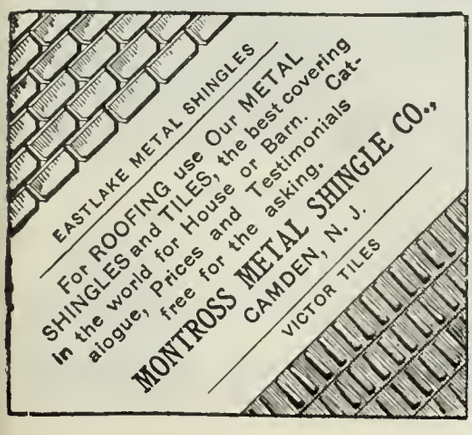
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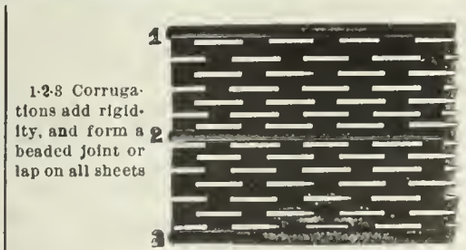
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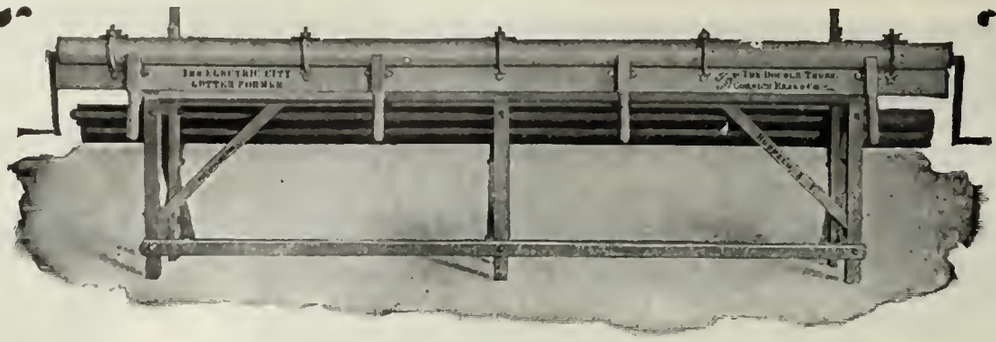
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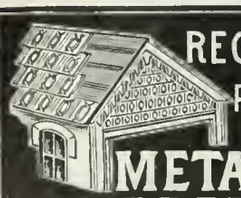
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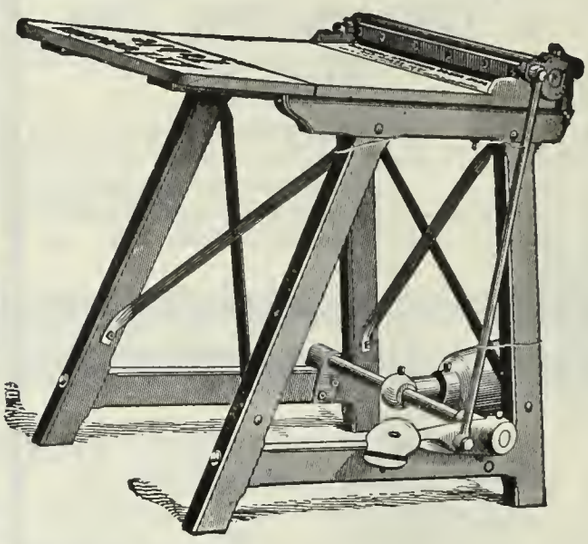
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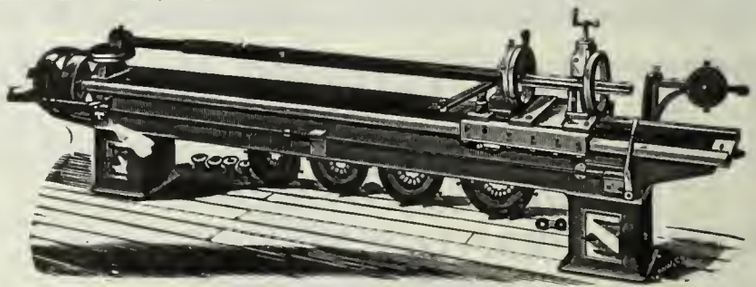
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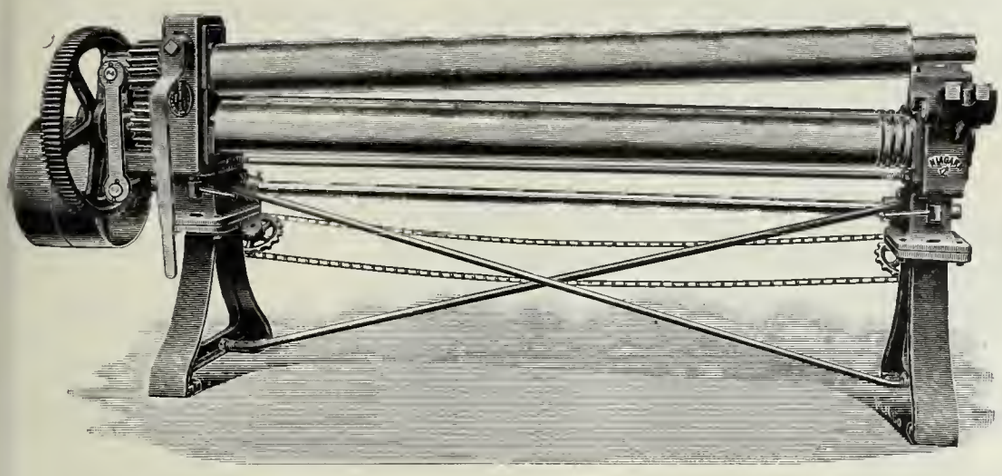
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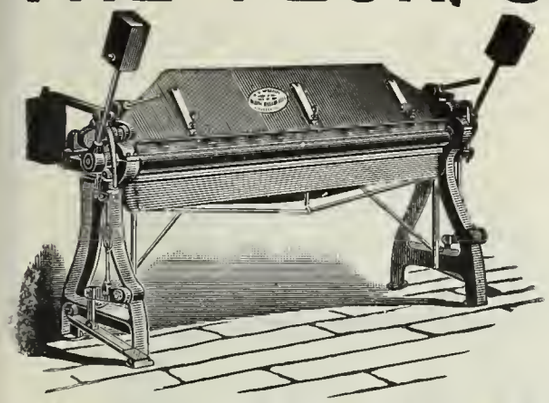
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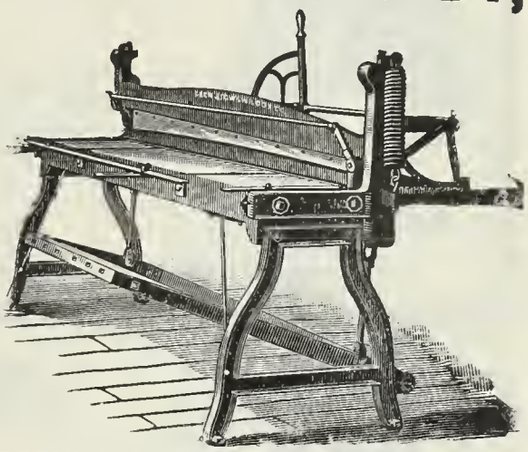
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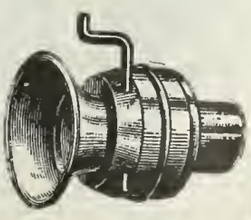
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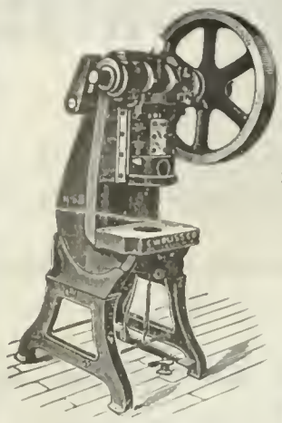
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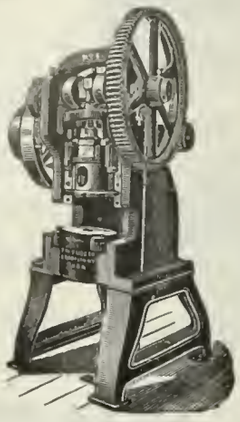


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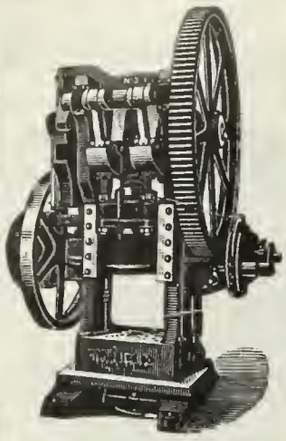
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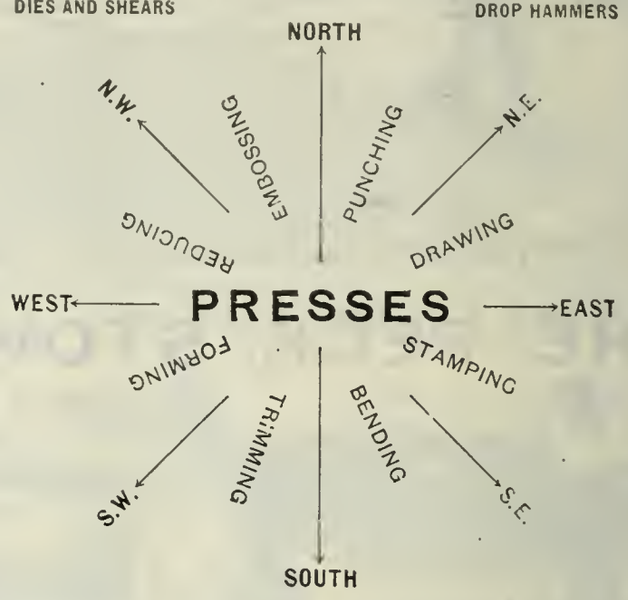
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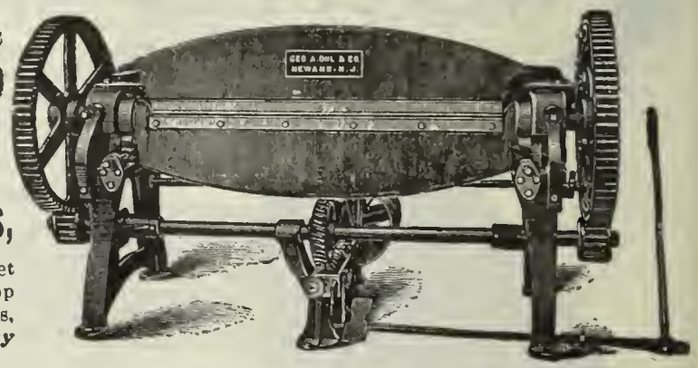
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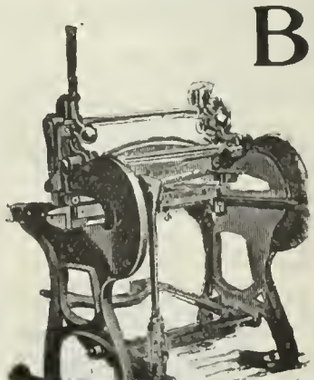
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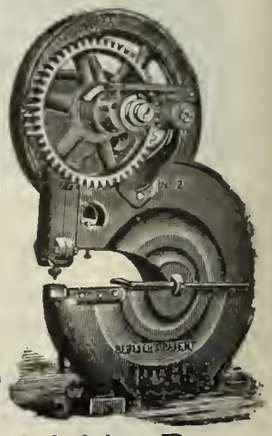
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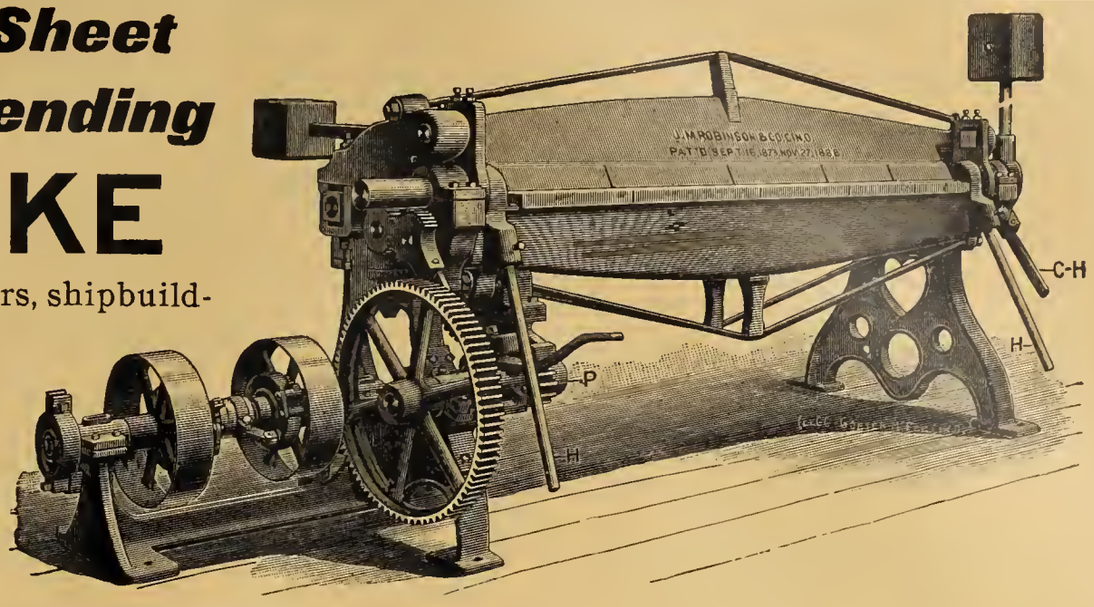


Agents: MERCHANT & CO., Philadelphia, Pa.

—FORCE OF HABIT.—Customer: "What's this? Seventy-five cents for a 2-cent stamp? Why, that is outrageous!"

Druggist: "Beg pardon, sir. I thought you had a prescription for it."—*Baltimore American.*

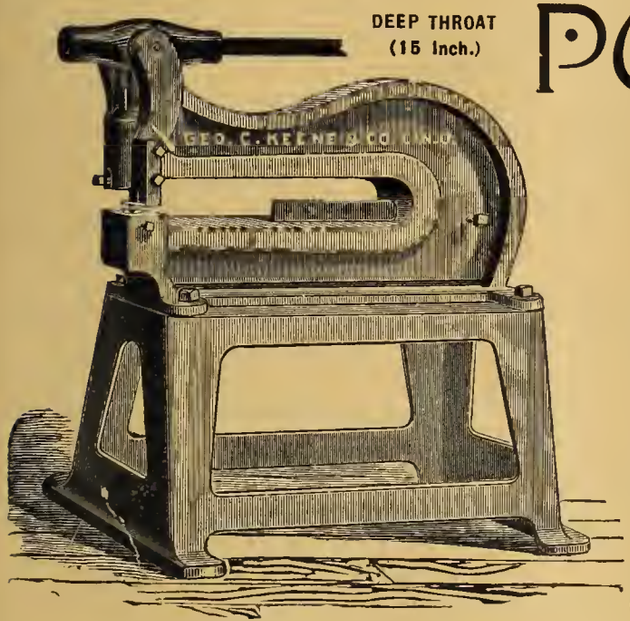
Heavy Sheet Metal Bending BRAKE



For range makers, shipbuilders, navy yards, and wherever heavy sheets are to be worked or formed. Made in 6 and 8 foot lengths, to bend No. 10 gauge or lighter.

THE J. M. ROBINSON MFG. CO.,

225-229 W. Second St., - - - - - CINCINNATI, O.



DEEP THROAT (15 Inch.)

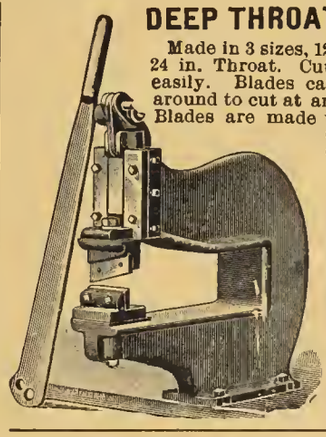
PUNCH.

Double Action.

Strong, easy of operation, cheap. Will punch ¼ inch hole through No. 10 iron or steel and lighter.

GEO. C. KEENE & CO.
Mfrs. The Keene Brake,
CINCINNATI. - OHIO

DEEP THROAT SHEARS



Made in 3 sizes, 12 in., 18 in. and 24 in. Throat. Cuts No. 14 Iron easily. Blades can be swiveled around to cut at any angle. The Blades are made with a Double Cutting edge. Can be turned over when dull. For cutting out Irregular Shapes or Holes in large sheets, is a Good Machine

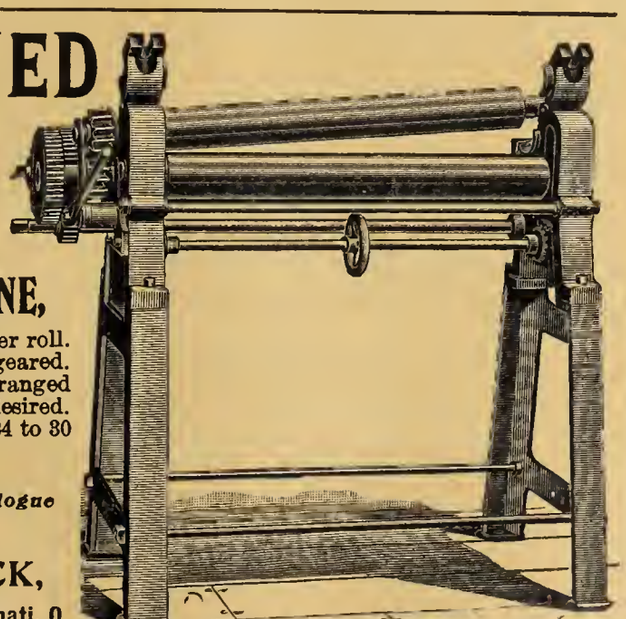
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PHILADELPHIA MACHINE TOOL CO.,
445 North Darien St., Phila., Pa.
TESTING MACHINES and *SOLE AGENTS* for HENNING TESTING APPARATUS.
PRESSES and SHEARS, CORNICE PRESSES CURVED MOULDING MACHINES, etc.

IMPROVED SLIP ROLL

FORMING MACHINE,



With lifting device for upper roll. Single or double back geared. With or without legs. Arranged for both hand or power as desired.
We make a specialty of 24 to 30 inch Squaring Shears.

Send for Complete Catalogue and Prices.

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PRESS-WORKING OF METALS.

A Treatise upon the Principles and Practice of Shaping Metals Dies by the Action of Presses, together with a description of the construction of such implements in their various forms, and of the materials worked in them.

BY

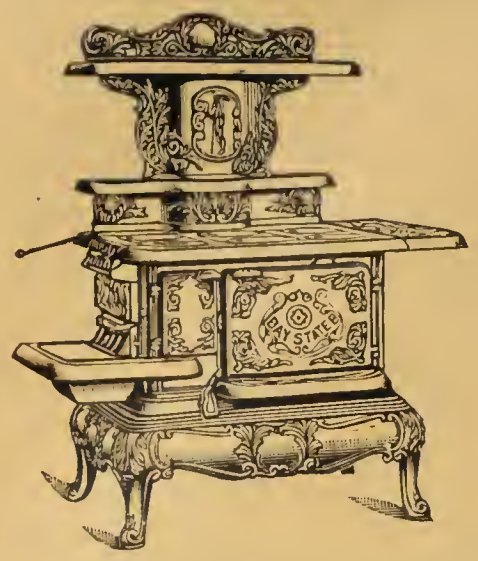
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TINNERS' TOOLS, MACHINES, and SUPPLIES. Plumbers' Tools, Tinners' Hdwe., Soldering Flux, Salts, Coppers, Rosin, Roofing Cement, Rivets, Bolts, Screws, Slaters' Tools, Second-hand Machinery and SKYLIGHT GEARING.
H. WEISS & CO., 20 Cliff St., N. Y.

"A good name is rather to be chosen than great riches."



But if *both* the "*good name*" and the "*riches*" can be realized, is it not much better? The name "BAY STATE" for 65 years has stood for all that is best in stove construction, and means good profits to the man who handles

"BAY STATE RANGES and FURNACES."

BARSTOW STOVE COMPANY,

BOSTON, 55 Portland St.
PROVIDENCE, R. I.
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Only the manufacturer can guarantee the worth of a product. We make Taylor Old Style ourselves from the raw materials, and guarantee every sheet.

N. & G. TAYLOR CO.

Sole Manufacturers

PHILADELPHIA

Established 1810

AUDITORIUM LIGHTING

At its best is expensive. Saving in the cost of fixtures is false economy. True economy consists in reducing the yearly lighting expense, and this is attained by using the best fixtures. Ours are made with a knowledge born of forty years' experience.

I. P. FRINK, 551 Pearl St., New York.

L. & R. WISTER & CO.,

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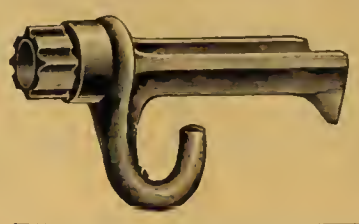
Dunbar Foundry Pig Iron.
Dunbar Connellsville Coke for Foundry Use.
American Sheet Iron Co.'s Sheet Iron.
American R. G., cleaned, of uniform black color.
Dealers in all kinds of Iron and Steel Scrap.

BRUCE & COOK.

TINNERS' TOOLS and MACHINES.

TINNERS' SUPPLIES.

186, 188 & 190 Water Street, and 248 & 250 Pearl Street,
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Ideal Sap Spout

Are made open or closed, and a full line of other Maple Sugar goods. Send for dealers' price list.

CHARLES MILLAR & SON CO, Utica, N. Y.

HUB RANGES

HUB

If you want the best line; the line with the **most attractive** and progressive selling features, look into the merits of the

Hub
Line of Ranges.
Steam and Water Heaters;
Hot Air and Combination Furnaces.

SMITH & ANTHONY CO., Boston.

The Man Who Sells

Glenwoods knows nothing of the trials and tribulations of the dealer who sells goods that are shoddy. Glenwood Ranges and Heaters are **made right, fitted right** and **shipped right**; and that means its easy to reckon profits. If you want to do a clean, satisfactory, profitable business — sell

GLENWOODS.

Write the Weir Stove Co., Taunton, Mass.

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Our Various Brands:

ADMIRAL, FORT PITT, FREEHOLD,

Are made from strictly New Metals and the Proportions Guaranteed.

McCLURE & CO.,

Manufacturers of Tin Plate,

PITTSBURGH, PA., 211, 213 and 215 Second Ave.

PHILADELPHIA, PA., 115 North 7th Street.

Index to Reading Matter, Page 55.

Index to Advertisements, Pages 57 - 59.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VII. R 12. | NEW YORK AND CHICAGO, MARCH 22, 1902. | ONE DOLLAR A YEAR. SINGLE COPIES 5 CENTS.

lall's Cast Iron Pipe Cutters.

SIZES: No. 1 cuts 4, 6 and 8 inches. No. 2 cuts 10, 12 and 14 inches. No. 3 cuts 16, 18, 20 and 24 inches.

Makes a SMOOTH, EVEN, CUT in or out of the Trench in one-tenth the time required by Hammer and Chisel.

OUR CATALOG OF ENGINEERS' AND STEAM FITTERS' TOOLS WILL INTEREST YOU.

LWORTH MFG. CO. *Boston, 128 Federal St. New York, Park Row Bldg.*



The Gorton Side Feed Boilers

FOR STEAM AND HOT WATER HEATING.

INVESTIGATE FOR YOURSELF.

Send for Catalogue and Prices.

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77 Oliver St., BOSTON. Prudential Bldg., ATLANTA, GA.



STOVE LININGS

McLEOD & HENRY CO., TROY, N. Y.

AMERICAN STEAM and ALTITUDE GAUGES, POP SAFETY VALVES.

Heating Specialties. American Steam Gauge & Valve Mfg. Co., Bismark St., Boston, Mass., U. S. A.

We like to sell single ranges and furnaces, but we like better yet to sell them in bunches of six, a dozen or a hundred. Not long ago, we sent six of our Excelsior Double Oven Ranges to Mr. J. W Morrison of Holmesburg, Penna., and this is what he did with them:

"I placed six of the 806 Excelsior Portable Double Oven Ranges in the buildings known as the Annex to the Morelton Inn, at Torresdale, Penna. Every one of these ranges has given entire satisfaction."

That double oven Excelsior Range, by the way, seems to occupy a field of its own. It is uniquely good.

ISAAC A. SHEPPARD & CO.

NEW YORK PHILADELPHIA BALTIMORE

OLLO BEST BLOOM ALVANIZED IRON.

ne best is Apollo. , uniform, workable. ed just right: no :ling: perfectly flat. ne worker is at his with it. Takes less besides.

an Sheet Steel Company, New York.

Wr at makes the

STEWART RANGE

so popular among the dealers?

Bc aus: it is a lively seller and brings good profit; it stays sold and nobody kicks at it except the coal man.

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This Ad. changes every week.

NOTICE.

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CLOBE and ANGLE VALVES, IRON and BRASS.

All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.

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Jenkins Bros.' Valves

are manufactured of the best steam metal, and are fully guaranteed. Why experiment with cheap valves? If you want the *BEST* ask your dealer for valves manufactured by Jenkins Brothers. Remember all genuine are stamped with Trade Mark like cut.

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The Leaders: Follansbee Pure Iron Old Style; made specially, having Charcoal Iron Base. Also, Scott's Extra Coated, well known everywhere. Samples on application.

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am Specialties.

and NOISELESS BACK TOR VALVES, PRESSURE VALVES. TRAPS, PUMP GOVERNORS, AND WATER STEAM and OIL SEPING VALVES, ARATORS TEMPERATURE CONTROLLER and No. 1 DAMPER REGULATORS

IELEY AND MUELLER, W. 13th St., - NEW YORK.

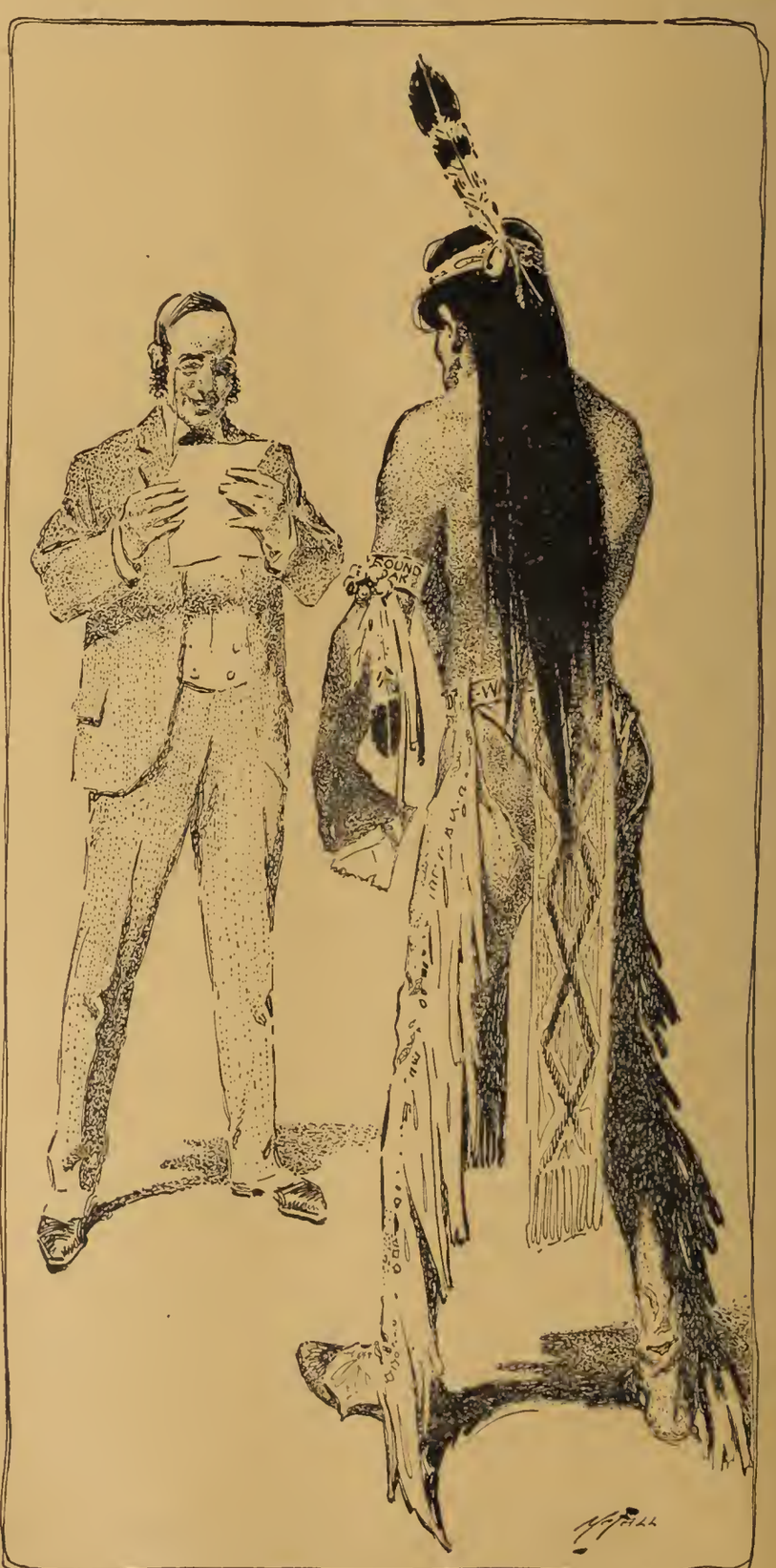
READ OUR "AD" Page 10. MAGEE FURNACE CO., Boston.

ROUND OAK
STANDARD of AMERICA

Here are a few lines from J. A. Eriksen, Baxter Springs, Kan.

"Kindly send me one water front for Round Oak Steel Range 8-18. This range is giving splendid satisfaction. I put it in the place of a —— range and it is baking with one-third less fuel than the —— range did."

They say testimonials do little good now-a-days, but when one comes in unsolicited, like this, we want some merchant to read it who appreciates good workmanship and who would like to sell something so good that his competitor cannot equal it. New catalogue.



ESTATE OF

P. D. Beckwith
DOWAGIAC
MICHIGAN

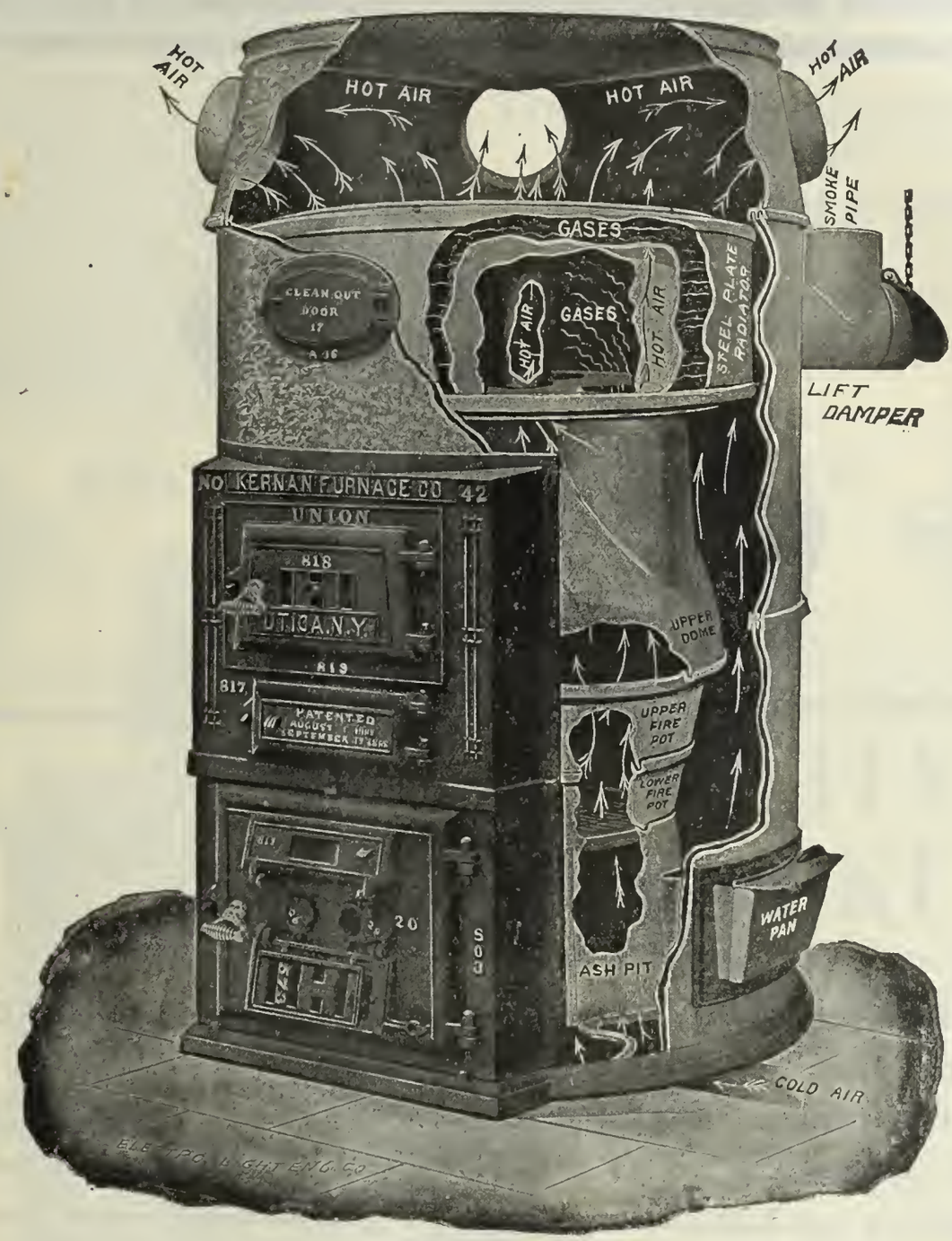
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CHICAGO

THE

Kernan Union

ABOUNDS IN "TALKING POINTS."



Why Don't YOU Handle it?

International Heater Co.,

UTICA, N. Y.

BOSTON. NEW YORK. CHICAGO. DENVER.

Largest Makers of Heaters in the World.

MOORE'S
QUICK OVEN STEEL STOVES



BACKBONE

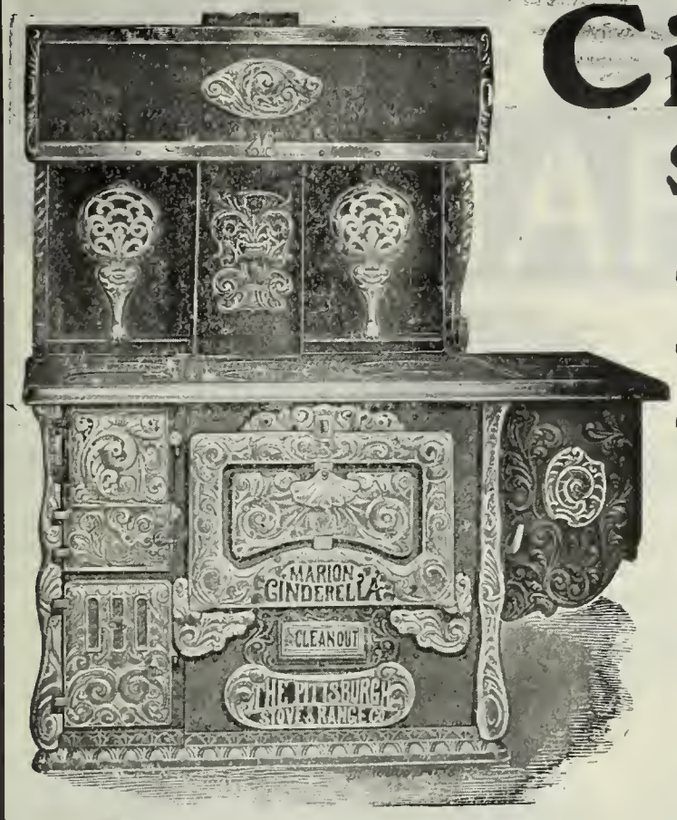
THERE'S NOTHING LIKE IT FOR KEEPING THINGS STRAIGHT.

In the putting together of *Moore's Quick Oven Stoves*, the flue strips are so attached to the Oven Bottom as to give it a real backbone and a rigid straightness, which you can count on being just the same in ten years as on the day the stove is sold. Our construction is the only one which insures this.

JOLIET STOVE WORKS,
JOLIET, ILL.

HOLBROOK, MERRILL & STETSON, San Francisco, Sacramento, Los Angeles.

38



Cinderella
Steel Ranges

REPRESENT

The Best Materials,
The Best Construction,
The Best Workmanship.

THEY ARE

The American Standard for Excellence.

ALL STYLES AND SIZES AT MODERATE PRICES.

We would be pleased to send our catalogue.

STOVES AND RANGES CINDERELLA NEVER FAIL

PITTSBURGH STOVE & RANGE CO.,

PITTSBURGH, PA.

WESTERN SALES AGENT,
W. D. Sager, 38 and 40 Michigan St., Chicago, Ill.

STOVES AND RANGES CINDERELLA NEVER FAIL



CITY BUCKEYE RANGE.

For Hard, Soft Coal, Wood or Coke.

MADE IN 17 AND 19 INCH OVEN.

Square Top and Bracket Reservoir Fitted with Water Heater.

AN ATTRACTIVE PIECE OF GOODS AND . . .

A Ready Seller.

Write for Descriptive Catalogue and Prices.

OHIO STOVE CO.

Portsmouth, Ohio.

MILLER GAS RANGE

Is as economical in the consumption of gas as any Range.

The Baking is simply perfect, and cannot be excelled by any other Range.

The Broiling is grand, broiling any kind of a steak in from seven to ten minutes.

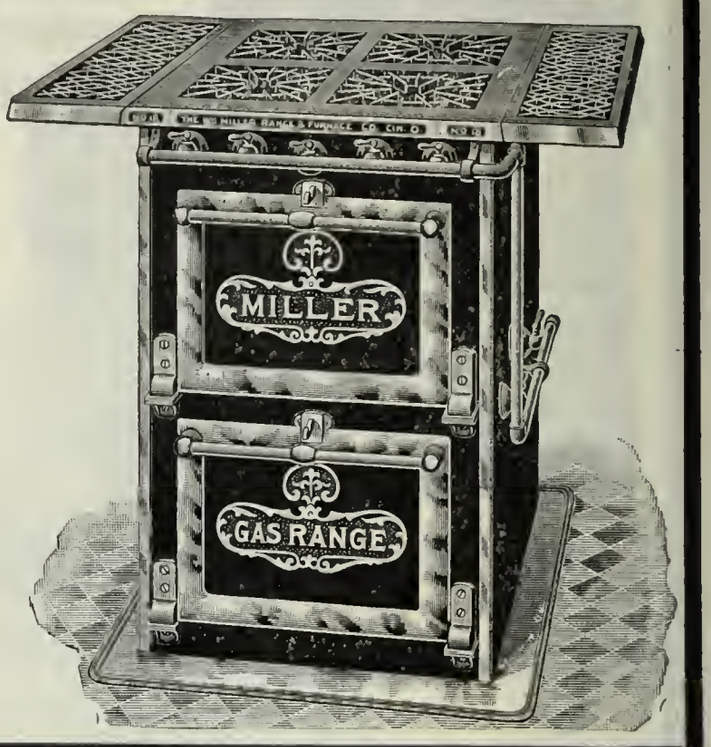
Is durable and simply constructed, so that any one can learn to run it in a few minutes.

Has *drop* doors which form shelves in front of the ovens, so that you can baste without holding the pans.

Is the handsomest Range ever built.

The *oven* can be drawn out from the front, so that if it should ever need repairing or replacing, it can be done without cutting the Range all to pieces.

The price is as low as any one can build a first-class Range for.



The only "All Steel" Gas Ranges in the Market.

MANUFACTURED BY

The Wm. Miller Range & Furnace Co.

Write for Catalogue and Prices.

125 and 127 E. Fifth St., CINCINNATI, O.

The New Schill Range!

The Most Modern and Up-to-date Range Made To-day.



Possessing special and novel features not found in any other line.
It must be seen to be appreciated.

The cut shows range with flush reservoir and high closet and front or pouch feed, also draft door below pouch feed which can be opened to light fire, which is a most desirable feature Another very desirable feature is our reservoir casing, which is cast iron and front of same is covered with sheet steel, thus giving it the appearance of a steel front, saving labor in blacking. Right end of reservoir casing is handsomely ornamented. It has spring balance oven door, ventilated oven, extra large ash pan, screw draft plate, very handsomely nickeled, and is decidedly the latest in stove construction.

THE SCHILL BROS. CO., Crestline, O.

THE NELSON-BOUQUET HDW. CO., Minneapolis, Minn., Northwestern Agents.
J. C. SHANKS, 1547 Wazee St., Denver, Col.
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OUR

CATALOGUE,

SHOWING

GAS RANGES
CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS

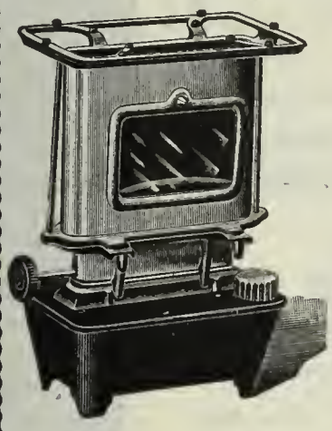
WILL BE FURNISHED FOR THE ASKING BY

Enterprise Stove Co., VINCENNES, IND.

THE TAYLOR & BOGGIS FOUNDRY CO.,

MANUFACTURERS OF

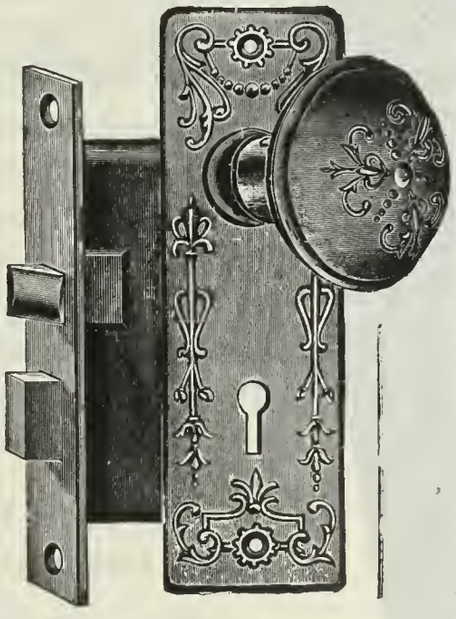
LIGHT GRAY IRON CASTINGS.

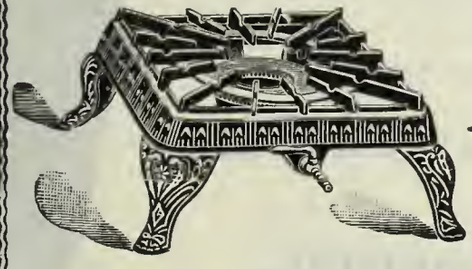


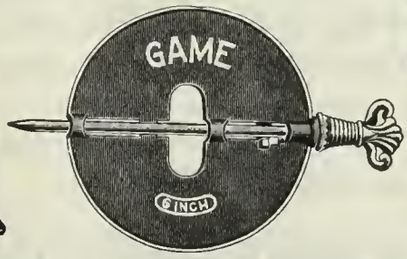
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Dampers, Oil and Gas Stoves.
Furnace Lamps,
Molasses Gates,
Letter Boxes,
Hardware Specialties.

CLEVELAND, O.

"Hudson" Design.



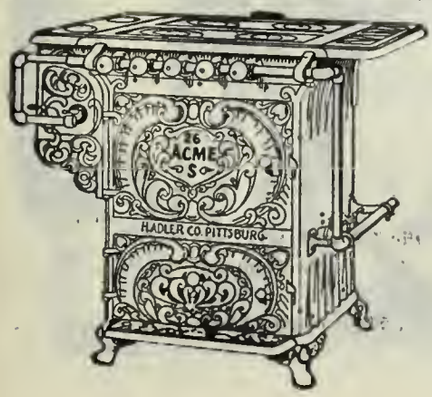




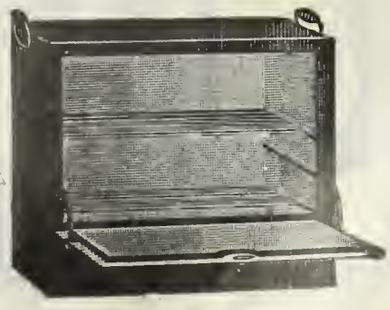
ACME LINE, 1902.

Asbestos Lined Ranges and Ovens, Cookers and Hot Plates.

FOR ALL GASES.



Catalog No. 35 on application.



H. ADLER CO.,

PITTSBURG, PA.

HENRY WATERMAN, - - 195 Lewis St., N. Y., Eastern Agent.

If it is any object to you to introduce an article that will win its way into about every household of your place, we suggest that you look into the

Peck=Williamson Laundry Dryer.

It will dry the clothes in 20 minutes and dry them clean and perfectly bleached. It uses the wasted heat from the laundry stove and keeps it in circulation. It gives off no odors. On its stove you can heat water, irons and do cooking.

One person may do the washing, while another follows right in her footsteps drying and ironing the clothes.

This Laundry Dryer is a wondrous labor saver. Besides it saves the clothes from destructive winds and storms. It relieves a woman from running out in the cold, exposing her health; the clothes never come in contact with soot and smoke and the like of that; the clothes last longer.

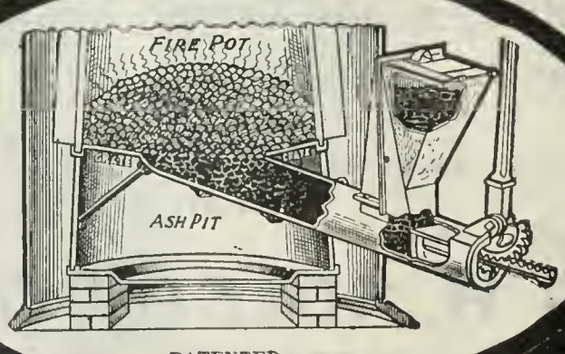
This is the Peck-Williamson Laundry Dryer in a nut-shell. All you need to bother yourself about is making the first sale. It will tell its own story to the whole town after that. It will pay for itself by what it saves. Do you suppose there is a woman under the sun who could look at this Dryer without making up her mind to have it?

Our new booklet will interest you. Free for the asking.

Our Under Feed Furnace is a new idea for making more heat at less expense. Ask us about it.

The Peck=Williamson Company,

CINCINNATI, OHIO.



PATENTED.

THE H.B.SMITH CO.,

WESTFIELD, MASS., U.S.A.

Catalogue furnished only upon application to

Heating Contractors, Engineers and Architects

92 Pages. Size 9 x 12 Inches.

COTTAGE BOILERS.

STEAM BOILERS (8 SIZES), 550 SQ. FT. RADIATION SUPPLIED.
WATER BOILERS (8 SIZES), 900 SQ. FT. RADIATION SUPPLIED.

PACIFIC COAST AGENTS

HOLBROOK, MERRILL & STETSON,

SAN FRANCISCO, CAL.

EUROPEAN AGENTS

AUG. EGGERS,

BREMEN AND NEW YORK CITY.

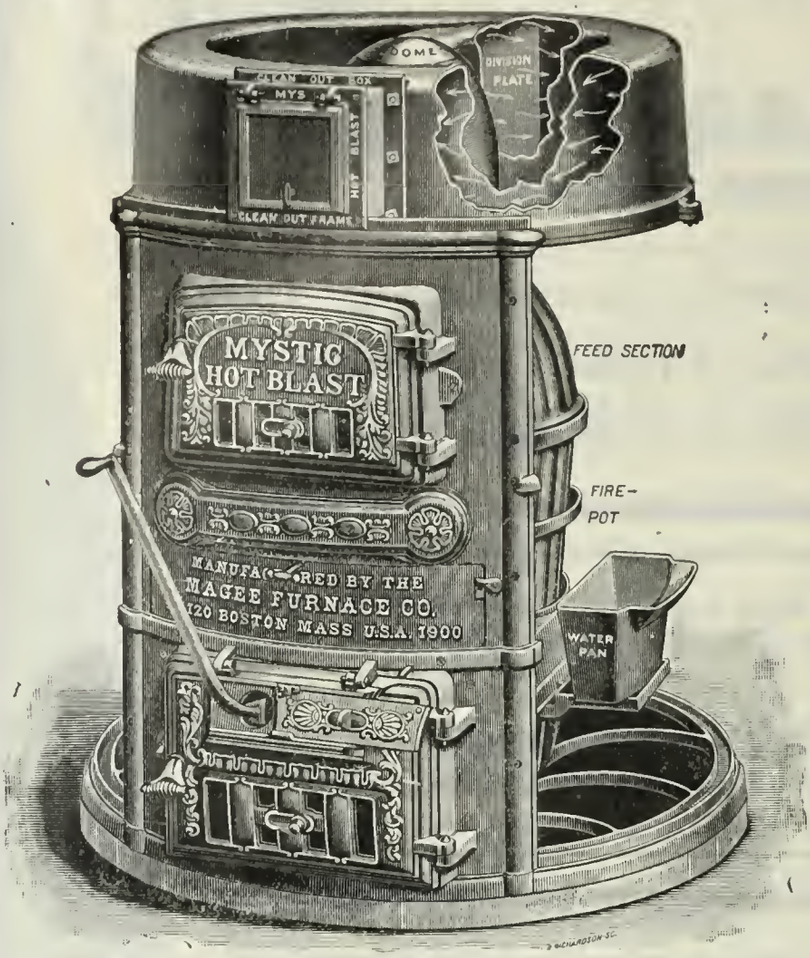
SALESROOMS:

THE H.B.SMITH CO.,

133 CENTRE STREET, NEW YORK.

510 ARCH STREET, PHILADELPHIA.

MAGEE MYSTIC HOT-BLAST FURNACE



Cast to Last.

No heater can be better than the material put into it. It may be worse. The material that enters into the

Magee Mystic Hot-Blast

is the best, while the Magee process of building is the result of 50 years' cumulative experience, seconded by unparalleled producing facilities, aided by immense capital.

FEATURES.

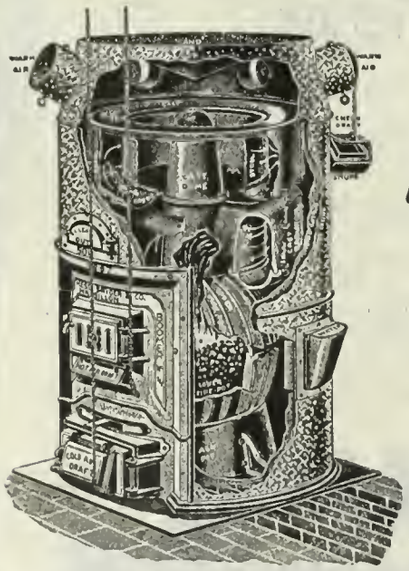
Low Construction, with either Solid Cast or Wrought Iron Return Flue Radiator; Economical; Durable; Easily managed. Heavy Sectional Pots; Cup Joints.

Write for our Furnace Catalogue.

MAGEE FURNACE CO., = BOSTON.

Most Complete Line under one name in the United States.

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Boomer Furnace.

REGARDING

Boomer Furnaces.

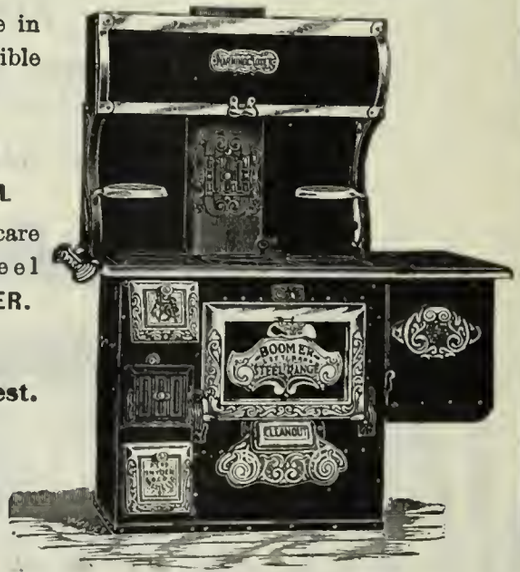
OR

Boomer Steel Ranges

We want to state in strongest terms possible that if you want the

HEAVIEST,
MOST DURABLE,
MOST ECONOMICAL

and easiest to take care of Furnace or Steel Range, buy a **BOOMER.**



Boomer Steel Range.

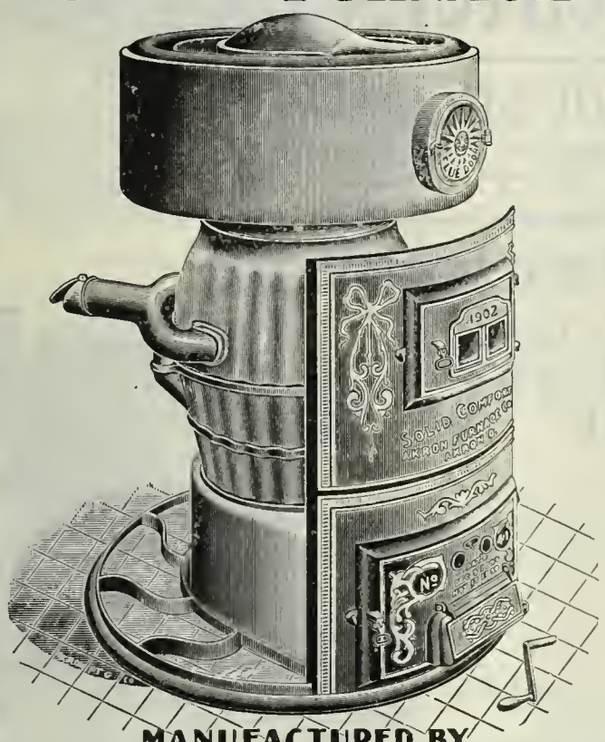
Neither time nor money is spared to make them the Best.
Buy Boomers and save your coal bills.
We invite investigation.

THE HESS-SNYDER CO.,

Manufacturers, MASSILLON, O.

BOUGHT RIGHT IS HALF SOLD.

SOLID COMFORT FURNACE



MANUFACTURED BY
AKRON FURNACE CO.
AKRON, OHIO.

This Applies with Emphasis to the

Solid Comfort Furnace.

The greatest luxury any one can have is good health and comfort. We add to your comfort by giving you a furnace easy to sell—a money winner.

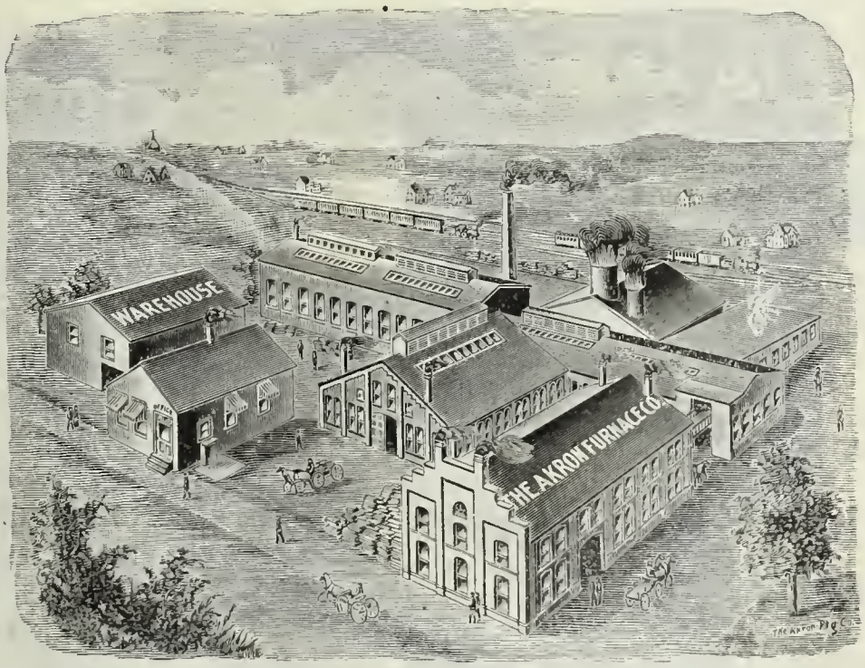
Factory capacity 5,000 furnaces per year. We want an inquiry from every dealer west of Cape Cod and east of San Francisco. Send at once for our circular and prices on

THE SOLID COMFORT

(any kind of fuel used)
and

THE LEHIGH KING

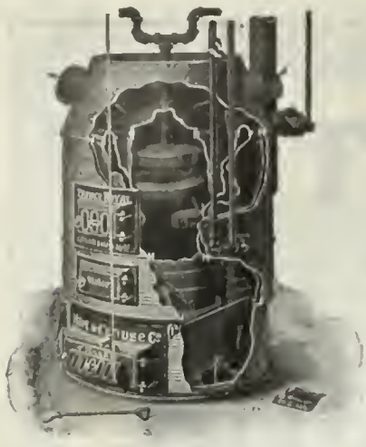
(an exclusively hard coal furnace).



THE AKRON FURNACE CO.,

Established 1880

AKRON, = = OHIO.





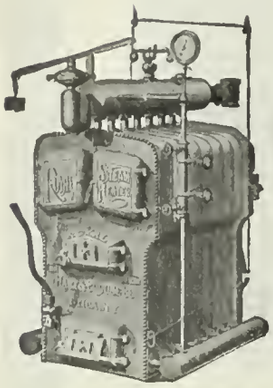
Royal Heaters.

HART & CROUSE CO.,

235 Water St., New York. 78 Lafayette St., UTICA, N. Y. 79 Lake St., Chicago.

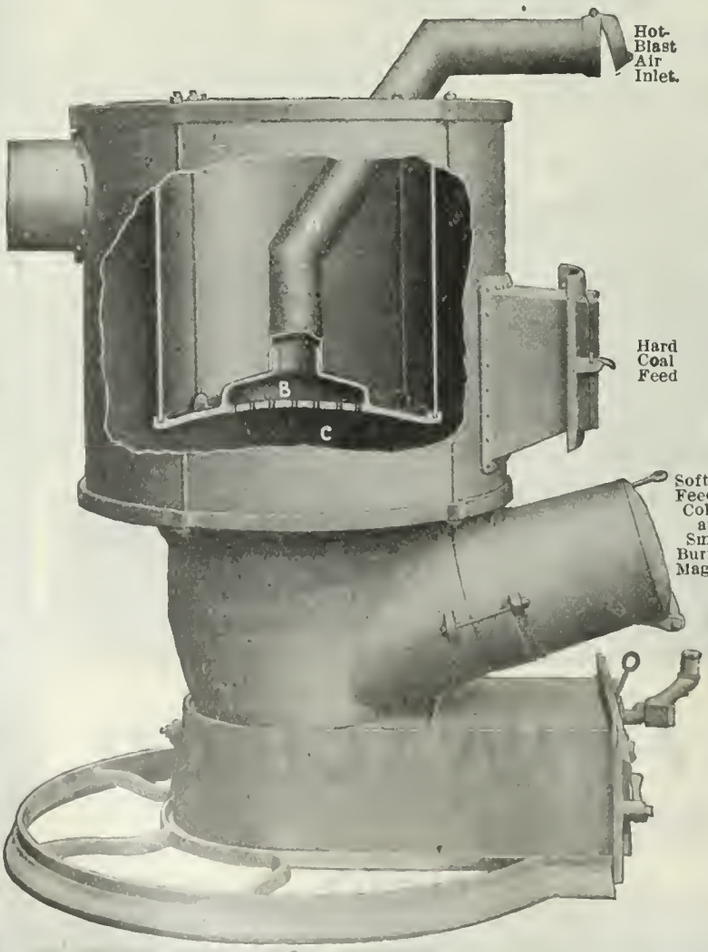
The Leading Line of Heating Apparatus.

HOT WATER,
STEAM,
HOT AIR.





THE PATRIC FURNACE.



A SUCCESS FOR 29 YEARS.

READ THIS ASTONISHING TESTIMONIAL:

SPRINGFIELD, OHIO, March 13th. '01.
THE PATRIC FURNACE CO., Springfield, Ohio.
GENTLEMEN:—The Patric Furnace put in our home by my grandfather in 1873 is still in use and has been continuously for the past 29 years, during which time it has given very good satisfaction. It heats the house now as well as when it was first put in.
(Signed) ARTHUR B. SMITH, M. D.

Our latest pattern ***"THE HUSTLER"*** as shown in cut (Casing and Front removed) is

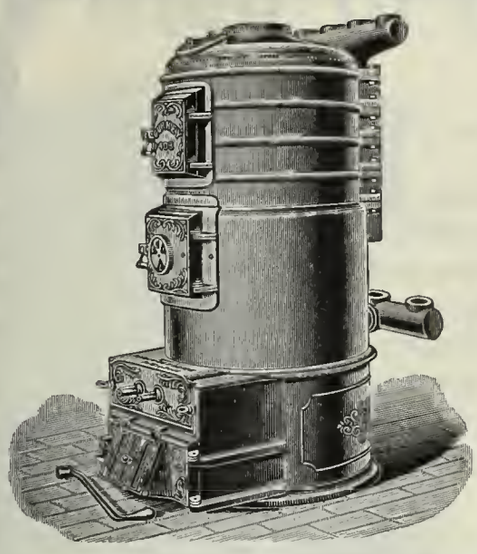
A POWERFUL HEATER.
EXCEEDINGLY DURABLE.
MADE OF GOOD MATERIALS.
SCIENTIFIC IN DESIGN.
SIMPLE IN CONSTRUCTION.
BURNS ANY KIND OF FUEL.
CANNOT CLOG. IS GAS TIGHT.

DEALERS—This is the furnace for you to tie to. Send for catalogue, price-list and discounts to trade.

THE PATRIC FURNACE CO.,

W. Washington Street,
SPRINGFIELD, - OHIO.

Both quality and price argue all the time in behalf of



"GURNEY" HEATERS.

Hot Water or Steam.

They are constructed along the most approved lines, have well proportioned grate areas, made of the best quality of iron by skilled workmen, and will be found thoroughly reliable in operation.

Capacities fully guaranteed.

Send for latest trade catalogue.

GURNEY HEATER MFG. CO.,

74 Franklin St., Boston. 111 Fifth Ave., New York City.

Western Selling Agents, James B. Clow & Sons, Franklin and Harrison Sts., Chicago, Ill.



Bengal Furnaces

ARE TRADE WINNERS.

Most powerful and compact furnace ever produced.—Over 3500 square inches radiating surface.—More than any other furnace their size.

ALL CAST IRON.

YOU NEED THEM IN YOUR BUSINESS.

Secure a BENGAL AGENCY at once.

WRITE US FOR CATALOGUE AND PARTICULARS.

EASTERN SELLING AGENTS:

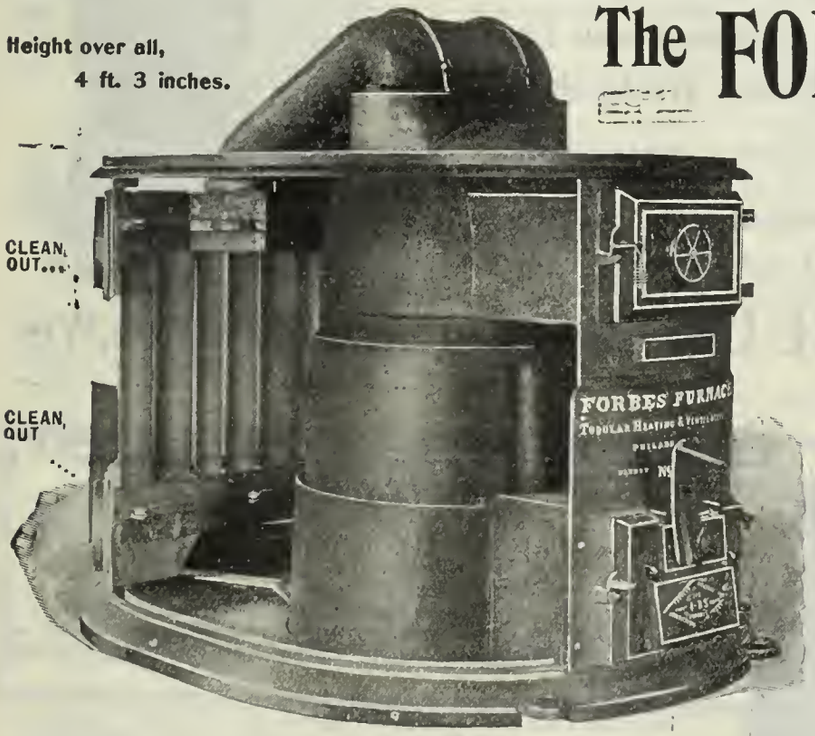
GURNEY & CO.,

Washington, Hanover and Elm Streets, Boston, Mass.

FLOYD, WELLS & CO., Royersford, Pa.

NEW YORK OFFICE, 210 WATER ST., R. W. HILLMAN, Manager.

The FORBES FURNACE.



You run no risk in putting in the

Forbes Furnace.

When properly installed we guarantee them in every case.

They are constructed entirely of cast iron.

No sheet iron drums.

Our radiating tubes are ⅛ in. thick, and will wear for years.

Specially suited for low cellars.

SEND FOR CATALOGUE AND FULL PARTICULARS.

Tubular Heating & Ventilating Co.,

228 Quarry St., Philadelphia, Pa.

STOVE REPAIRS

Bought from us entitle the purchaser to a 1000 mile book *Free*, on any railroad.

CHAS. C. HEATH & CO., Philadelphia and Baltimore.

Write us for particulars.

TURTLE Oil for Rheumatism is probably no better than goose oil, lard or tallow, without you've got more faith in it.

Probably you think a Knabe piano is better than a Chickering or Ivers & Pond, but if you were asked WHY, probably you couldn't tell HOW it is different.

We think the **"WINTHROP"** Hot Water Heater the best one that there is.

We've got good, sensible reasons why it is better and why we think it will do better and more economical work than others having about the same general measurements.

Our reason why the price is less is because you don't have to pay for an extensively advertised NAME.

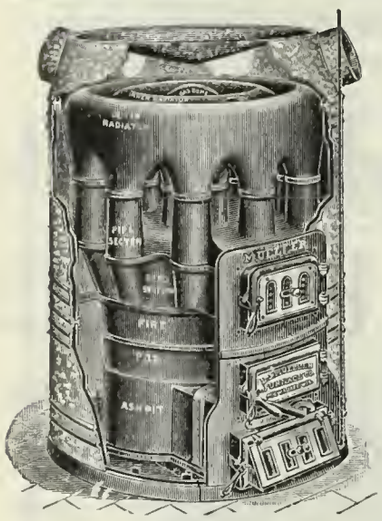
If you'll write us for prices, we'll convince you that our prices are really very much less than other boilers of about the same capacity are sold for.

DIGHTON FURNACE CO., Taunton, Mass.

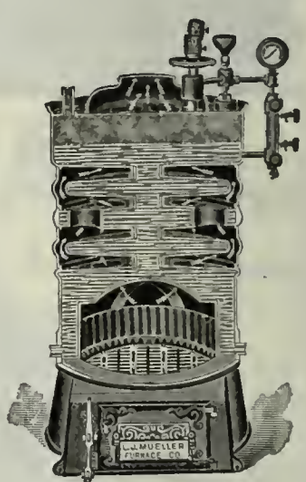
YOU DON'T HAVE TO GO AWAY BACK AND SIT DOWN

IF YOU SELL

MUELLER



FURNACES AND BOILERS.



They Bring Business, and That is What All Dealers are Looking for.

WRITE FOR OUR CATALOGUE AND PRICES.

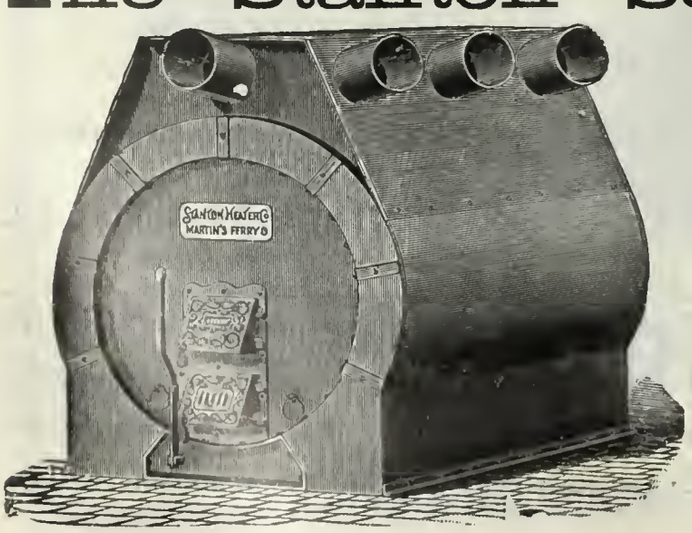
We Sell Everything in the Heating Line.

GET OUR REGISTER PRICES.

L. J. MUELLER FURNACE CO., 190 Reed St., Milwaukee, Wis.

The Stanton Seamless Heater,

PORTABLE CASED.



WEST LIBERTY, IA., June 22, 1900.

THE STANTON HEATER CO.,
Martin's Ferry, Ohio.

Gentlemen:—I had a Stanton Seamless Heater put in my house last year and it gives perfect satisfaction. Have no trouble in keeping the whole house comfortable in the coldest weather.

Anyone wishing a Furnace will not make a mistake in buying a Stanton Seamless Heater.

Yours truly, DR. L. W. STRUBLE.

SEND FOR CATALOGUE.

THE STANTON HEATER CO.,

Martin's Ferry, Ohio.

See Our Advertisement Next Week.

A Word to the Wise is Sufficient!



RIVAL.

The **Wise Dealer** should keep in mind **these words,** viz :

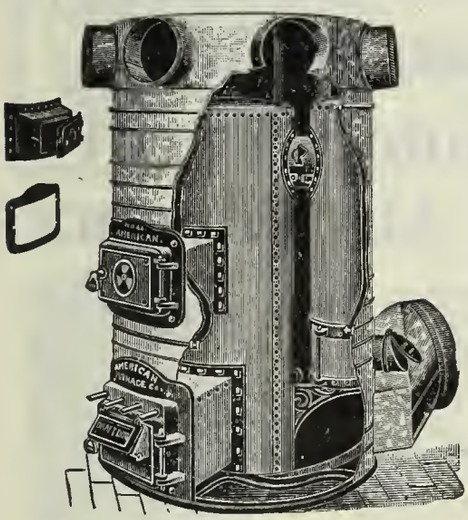
FAULTLESS Furnaces,
HERO Furnaces,
COMFORT Furnaces,
RIVAL Furnaces.

They speak for themselves, and have been **talking** for years in many places. If **YOU** have not heard from them, now is the time to give them a chance.

The GRAFF FURNACE CO.,

MANUFACTURERS,

208 WATER ST., NEW YORK.



Burn Hard or Soft Coal, or Coke. Large Doors.

Some Ripe Experience

Has come to us through watching the doings of dealers throughout the United States.

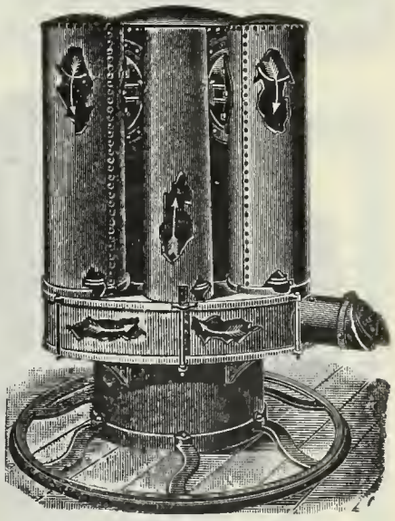
We find that the dealer who sells cheap furnaces not only loses ground in the furnace business but also has a falling off in his other lines.

On the other hand, we can say that the man who sells a good furnace and charges enough to do a good job will, in a few years, be the leading furnace man in his town and at the same time build up his other business.

The ***American Furnace*** is made for the better class of trade; is durable, clean and economical in fuel.

The American Furnace Co.,

1911-13 PINE STREET, ST. LOUIS, MO.



Large Radiators, easy to clean out.

Write for prices and secure the agency before the other fellow gets it

---

REFRIGERATORS,
BLUE FLAME OIL STOVES,
GASOLINE STOVES.

LARGEST JOBBERS
in
NEW ENGLAND.

GAS RANGES,
FURNACES, STOVES,
RANGES AND REPAIRS.

HENRY N. CLARK CO., 56 and 58 UNION ST., Boston, Mass.

BRAND STOVE CO.

STOVES, RANGES and FURNACES.

SEND FOR CATALOG.

MILWAUKEE, WIS.

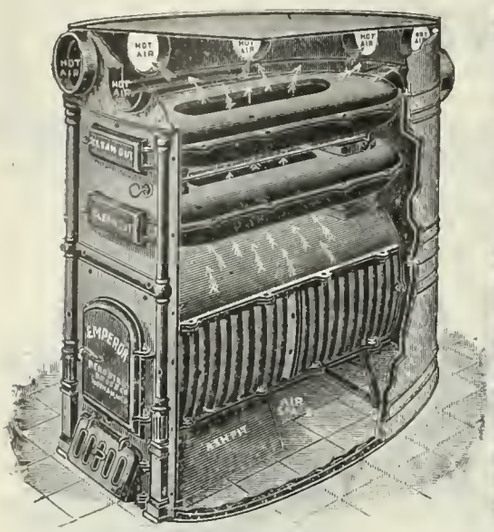
For a swell job

You ought to know our line—many a dealer loses an opportunity to make a good profit because he knows only heating stoves and furnaces.

We can post you concerning steam and hot water heating, so you can get a share of what is due you.

KEWANEE BOILER COMPANY

KEWANEE, ILLINOIS.



Emperor Furnaces

FOR WOOD.

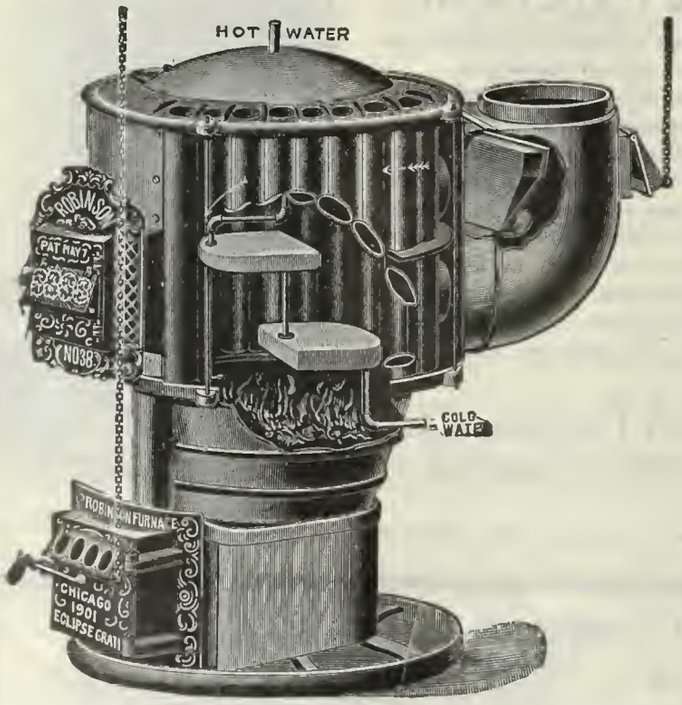
Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces. . . . .
Furnished for either Brick or Galvanized Iron Casing

SEND FOR CATALOGUE.

Bergstrom Bros Co.

NEENAH, WIS.



The Robinson Tubular Warm Air Furnaces

give universal satisfaction wherever used.

They are up-to-date in every respect and have many special features not found in other furnaces.

WRITE FOR CATALOG.

ROBINSON FURNACE CO., Chicago.



WINCHESTER

The path of the "WINCHESTER" Heater is quite similar to that of a bottle of "Mumm's" drank by a friend of ours a few nights since. It went to the head, but, unlike the "fizz," it stayed there. It's a good heater to secure the agency of. Smith & Thayer Company, Boston, Mass. 106 Beekman St., New York.



HEATER.

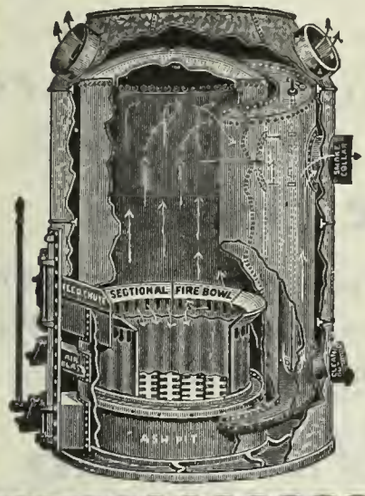
STAMFORD FOUNDRY COMPANY

MAKERS OF

RANGES COOKING AND HEATING STOVES
HOT-AIR AND COMBINATION AIR AND
WATER FURNACES
LAUNDRY STOVES CONFECTIONERS' STOVES
CABOOSE RANGES ETC ETC

STAMFORD CONN

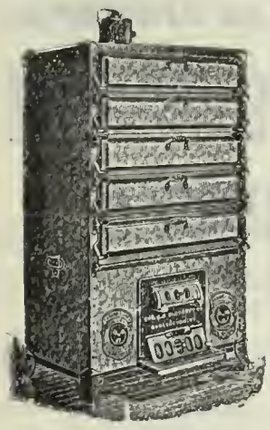
The Torrid Zone Furnace



is a trade winner because it has points of merit peculiar to itself that can be found in no other steel furnace. Our new catalogue is now ready to mail and a description of our Hot Air and Hot Water Combination Furnace can be seen in it. We furnish either the cast iron lining or the fire brick at the same price. Our Wood Furnace is called a powerful heater by those who use it.

CATALOGUE FREE.

Lennox Manufacturing Company,
Eighth Ave. and Frederick St.,
MARSHALLTOWN, IOWA.



CABINET
PORTABLE OVEN.

OUR LATEST PRODUCTION.

BAKES EVENLY BY THE CIRCULATION OF HOT AIR.

FOR BAKERS, CONFECTIONERS, HOTELS,

Also the best oven for Core Baking, Japanning, Enamelling, etc.

Made in six sizes, single and double, for coal, wood, natural or artificial gas.

SEND FOR CATALOGUE.

The G. S. BLODGETT CO., Burlington, Vt., U. S. A.



THE CANTON PERFECT BLAST.

CANTON PERFECT BLAST AND OAK
WARM AIR FURNACES

Heavy Castings, Tubular Radiator,
Large Secondary Radiator,
A Perfect Blast,
ALL INSIDE THE CASING.

THE BONNOT COMPANY, Canton, O.

HOT WATER AND HOT AIR



HEATING BY COMBINATION STOVES AND FURNACES.

Suitable for Large or Small Houses, Stores, Conservatories, Barber Shops, Hotels, etc., etc.

Heat Water Quickly.
Circulation is Positive.
No Joints Inside to Leak.

THE NATIONAL PIPE BENDING CO
160 RIVER ST., NEW HAVEN, CONN.

ABC

AN OPEN AND SHUT QUESTION.



Do you need a Simple, Effective and Inexpensive Blast Gate?

"A B C" Blast Gates

for closing pipes in exhaust, blast and heating systems are unexcelled.
Send for Price List.

American Blower Co.,
Detroit, Mich.
New York. Chicago. London.

ABC

THE S. & S. PATENT
Stove Pipe Thimble



Locks the Pipe from Pulling Out, and from Pushing In and Closing the Draught. Will last a lifetime. Nothing to wear out, and costs but a trifle. *Send for sample* and prices.

City Forge and Iron Works,
DAYTON, OHIO.

Pierce

BOILERS and RADIATORS

for Steam and Water Heating.



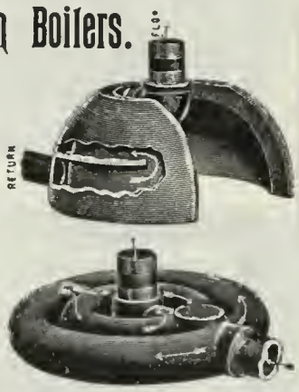
Pierce Tubular Steam Boiler.

LARGE HEATING CAPACITY.
ECONOMIC IN FUEL CONSUMPTION.

Endorsed by the foremost Architects and Heating Engineers.
Write for New Illustrated Catalogue.

Pierce, Butler & Pierce Mfg. Co.,
Syracuse, N. Y.
New York. Boston. Philadelphia.

The Champion Hot Water Combination Boilers.



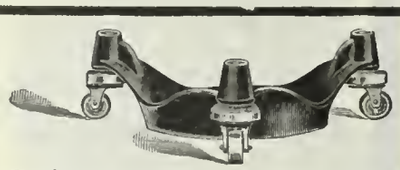
They Fit Any Furnace.

Base section when used without ring sections.

Ring Section.

These Boilers are made in three sizes diameter, and from 100 to 600 square feet radiation capacity.
Will heat those cold rooms, or an addition to the building. Will increase the capacity of any furnace. Are cheaper than coils and will do more work.
Write for new circular. Manufactured by

FRANK D. STOLZ,
115 Lake St., Chicago, Ill.



Going to put some new ranges on your sample floor this Spring? :: ::
To make them show up just right they should be mounted on Independent Stove Casters. :: :: ::
They don't cost much.
Write us. :: :: :: :: ::

INDEPENDENT REGISTER CO.,
152 Champlain St., CLEVELAND, O.

"TORRID HEATER."
FOR STEAM OR HOT WATER.



It is Practical in Design.
It is Safe, Being Tested to 200 Pounds.
It is Easy to Manage and Keep Clean.
It is Durable.
It is Sectional and Easily Handled.
It has No Packed Joints.
It is Self-Feed or Surface Burning.
It has the Torrid Patent Rocking and Dumping Grate.
It is Low in Price.

SEND FOR CATALOGUE.

MANUFACTURED BY

W. H. DRAKE, No. 36 Clinton St., NEWARK, N. J.

Factory: Hackettstown, N. J.



Brien Heater.

A perfect, all cast WOOD or COAL burner. There is no other Hot Air Furnace as low down as the "BRIEN."

Write for territory, catalog and prices.

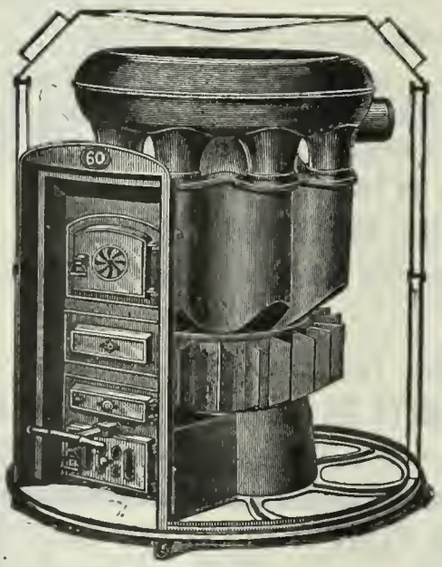
BRIEN HEATER CO.,
HOOSICK FALLS, N. Y.



Vance Boilers.

The most economical Steam and Hot Water Boiler on the market. Write for Catalogue and Price List.

VANCE BOILER WORKS,
373 Atkinson St., Geneva, N. Y.



Imitation is Flattery.

Cory's All Cast FURNACES

HAVE BEEN COPIED BUT NEVER EXCELLED.

An Absolutely Gas Tight Furnace Without Bolted Joints.

UZAL CORY & CO.
210 WATER ST., NEW YORK.
Established 1847.

20th Century Gas Stoves

THE BEST GAS STOVE MADE.

Best Materials and Workmanship. Prices Low. Mail Orders Promptly Filled.

STOVE REPAIRS IN STOCK FOR 2,000 STOVES AND RANGES.

Write for Prices.

THE METROPOLIS SHEET METALS AND STOVE REPAIRING CO.,
261-261½ Springfield Ave., Newark, N. J.



NOW READY

Our 1902 Boiler Catalogue

handsomely illustrated
and showing a few

New Types of Ideal Boilers.

A Postal card request will secure for you a copy of the first edition.

AMERICAN RADIATOR COMPANY

Boston
New York
Buffalo
Philadelphia

Lake and Dearborn Streets
Chicago, U. S. A.

St. Louis
Minneapolis
Denver
London

FURNACE DEALERS: By the use of

THE JONES SIDE WALL REGISTER

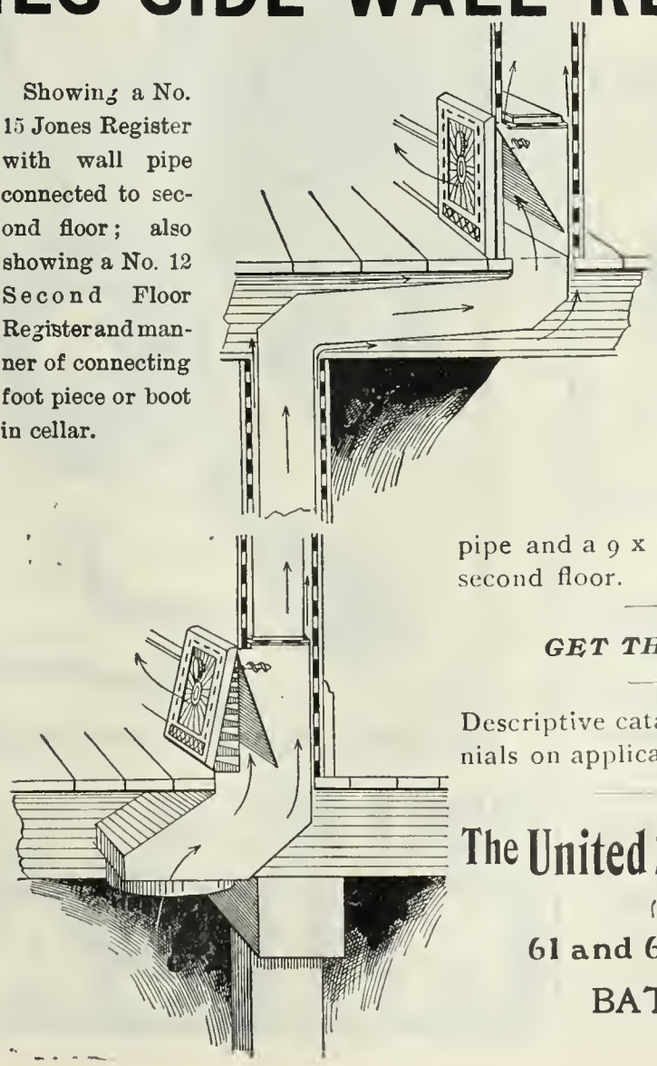
The COST of installing furnaces is REDUCED and the EFFICIENCY of furnaces is INCREASED.

No CUTTING Carpets. No SOILED Walls.

The Jones Registers include

A Double Register Box and Deflector.

Therefore less cost installing furnaces with JONES Registers and better results from your furnace.



Showing a No. 15 Jones Register with wall pipe connected to second floor; also showing a No. 12 Second Floor Register and manner of connecting foot piece or boot in cellar.

One 12-inch basement pipe will discharge more warm air into the living rooms, and less will be radiated into the basement, when connected to a No. 15 JONES Register on the first floor, with a wall pipe continuing to a No. 12 JONES Register on the second floor, than one 10 in. pipe connected to a common floor register on the first floor and an 8-inch pipe connected to a wall pipe and a 9 x 12 convex register on the second floor.

GET THE AGENCY NOW.

Descriptive catalogue, prices and testimonials on application.

The United States Register Co.
(Limited),
61 and 63 E. State Street,
BATTLE CREEK, MICH.



As Good as Gold is a

RICHMOND

HEATER.

IT CUTS YOUR COAL BILL IN TWO.
IT WARMS YOUR HOUSE FROM CELLAR TO GARRET, AND ALMOST TAKES CARE OF ITSELF.

Write for Catalogue.

The Richmond Stove Co.
NORWICH, CONN.

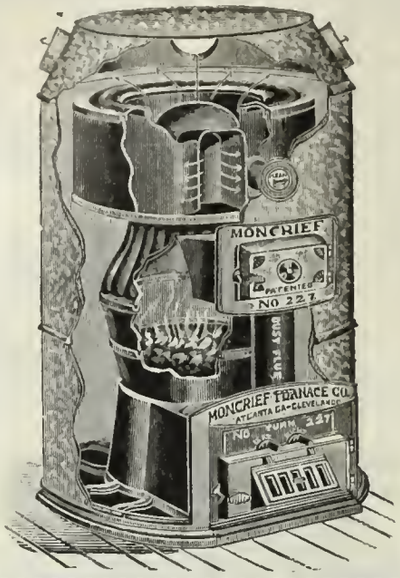
GLENDALE
Stoves and Ranges



Manufactured by
SOMERSET STOVE FOUNDRY CO.,
SOMERSET, MASS.
Send for catalogue.

SCRANTON CORUNDUM & EMERY WHEEL CO.
1311-1315 Capouse Avenue, SCRANTON, PA
Write for Catalogue.
OUR "BLACK DIAMOND" artificial abrasive wheels are especially adapted for **The Stove Trade**
THEY ARE THE BEST.

The Milwaukee Pattern Works.
Ornamental and Stove Patterns.
Sketches and Designs for Stove Work of all kinds.
Correspondence Solicited.
605-507 Cedar Street, MILWAUKEE, WIS.



MONCRIEF FURNACES

PORTABLE and BRICK SET.

Unequalled in the Great Essentials---Simplicity, Durability, Economy, Capacity, Comfort

NO BETTER MADE.

Write for catalogue. Special price to the trade.

MANUFACTURED BY
The MONCRIEF FURNACE & FOUNDRY COMPANY, ATLANTA, GA.



THE VICTOR INSTANTANEOUS WATER HEATER

Is the cheapest, the most efficient and the neatest Water Heater made. It occupies but little space and is always ready, furnishing hot water in a few seconds day or night.

Send for Descriptive Circular, Prices, Discounts, Etc.

W. J. ADAM, - - Joliet, Ills.

ARCTIC STOVE TRIMMINGS.

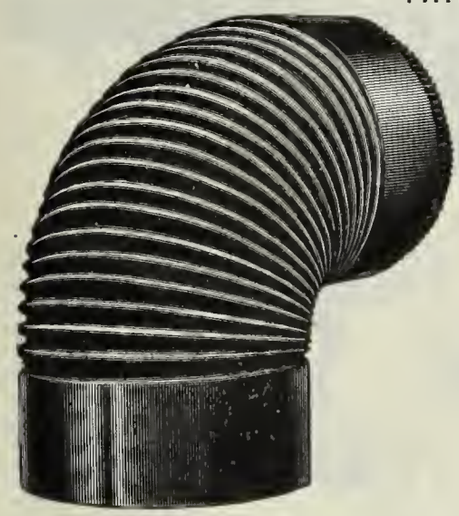


FANNER MFG. CO., - CLEVELAND, O.

MICA
EUGENE MUNSELL & CO.
MINERS & IMPORTERS
NEW YORK. 218 WATER ST. CHICAGO. 117 & 119 LA...

Perfect Elbows

PATENTED.



You should have the Perfect Elbows in stock for your "particular" customers. These Elbows are neater and handsomer than any others and give a finished appearance to a stove pipe that an ordinary Elbow does not.

All Sizes, 3 to 8 inches.

Common One Pass, Refined Blue, Planished and Galvanized.

We are booking orders for shipment any time this year.

Write our house nearest you.

SIDNEY SHEPARD & CO.,

Buffalo, New York City, Chicago, Kansas City, St. Louis, Denver, Seattle. San Francisco.

STOVE BANDS
—AND—
RINGS.

SPECIAL TUBING.
Cut to Length and Plated.
FLAT STRIPS & CORNERS.
SPECIAL
PUNCH
PRESSWORK
SOLICITED.
Quality and Finish the Best.
The Kirk Manufacturing Co.,
TOLEDO, - - - OHIO.

Fire Brick Linings
—FOR—
Stoves, Ranges, Furnaces.

Eagle Stove Clay.
Incandescent Gas Fuel.

CUPOLA LININGS
For Iron and Brass Foundries.

WILLIAMS STOVE LINING CO.,
TAUNTON, MASS.

PIONEERS — LEADERS

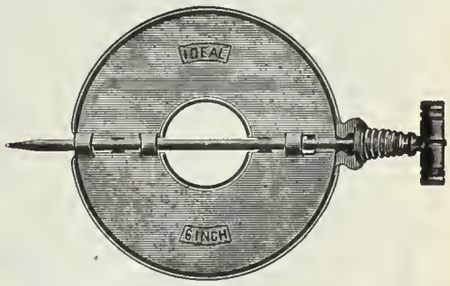
LOW SPEED DYNAMOS. NICKEL ANODES. LACQUERS.

NICKEL PLATING OUTFITS

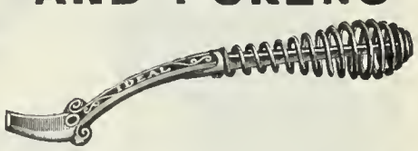
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IDEAL DAMPERS, COVER LIFTERS



AND POKERS



HAVE NON-HEATING HANDLES OF ELEGANT DESIGN AND FINISH. THEY ARE THE BEST.

STOVER MFG. CO
164 RIVER ST.,
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SELECTED MICA

. . . ONLY . . .

Prepared expressly for the Stove and Hardware Trade.

Two Grades: "North Carolina" and "Nevada."

PRICE LISTS AND DISCOUNTS SENT ON APPLICATION.

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115 Beekman St., New York.



DO you want Stoves and Heaters that are easily sold and *STAY SOLD?* We have been very successful in designing patterns for such.

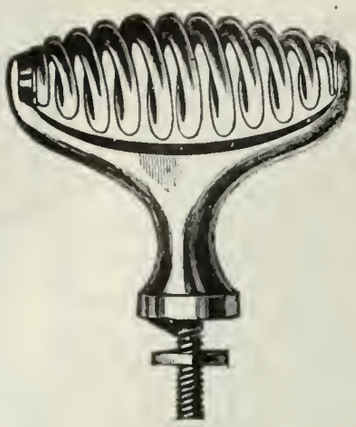
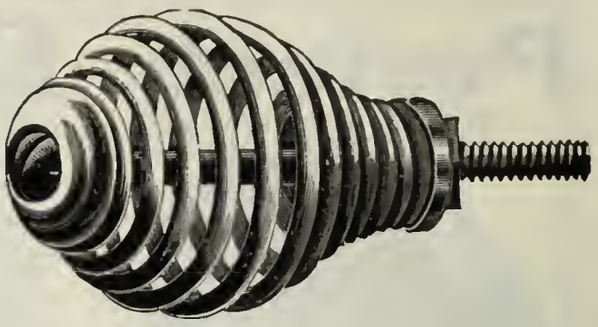
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MICA

Specially Prepared for the Stove Trade.
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THE GEORGE W. COPE
Stove Pattern Works.
ORIGINAL, ARTISTIC AND PRACTICAL CONSTRUCTION.
Cor. Randolph and Atwater Sts.,
DETROIT, : : MICH.

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ESTABLISHED 1880.

All The Latest Novelties in Stove Trimmings.

ALWAYS COLD.

If you want your stoves up-to-date you must use
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Who sells cheap goods at cheap prices cannot expect to enjoy his share of the general prosperity of the country.

Standard goods at moderate prices is the correct motto.



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"O.H." ONE PIECE STOVE PIPE Elbows

Perfectly round and true to size. With long ends, DOUBLE LOCK SEAM in throat or under side of Elbow.

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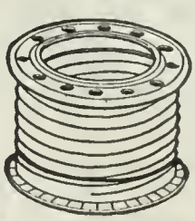
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First-class in wood and iron.

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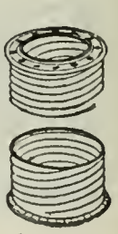
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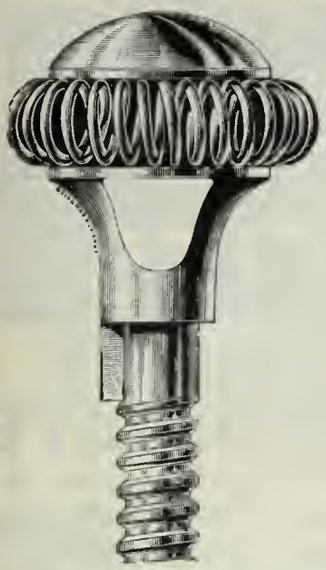
FOR PARTITIONS AND CEILINGS.

Can easily be adjusted to any thickness of wall, and when screwed up tight against plaster will not work loose and allow the plaster to crumble and fall.

It is perfectly fire-proof, low in price, and never fails to interest customers.

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No. 346 Draft Register.

No. 520 ZERO Screw Knob.

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Peerless Aluminum Enamel

IT may be applied to any surface, looks like Frosted Silver.

Heat and water will not affect it.

Its brilliant lustre is lasting and it will not tarnish.

Put up in 1-6-pt., ¼-pt., ½-pt., 1-pt, 1 qt., ½-gal. and 1-gal. cans.

Manufactured by The NICKEL PLATE STOVE POLISH CO., CHICAGO.

LEATHER and RUBBER WASHERS,

Machine cut, at less price than can be cut by hand. Send Sample for prices.

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SHINES FOR ALL

It is the polishers' friend, and will polish anything. Write for free sample to

297 E. Washington St., Ind'p'l's, Ind.



GEO. W. HOFFMAN.

HANDLE THE BEST.

CHAMPION STOVE CLAY

Is the only brand made of crucible materials, viz.: Imported German Fire Clay and Plumbago from Ceylon.



Dealers are invited to send for circulars.

Packed in neat, attractive, round pasteboard boxes of three sizes: large, medium and small, holding about 10 lbs., 6 lbs. and 2½ lbs., respectively.

ALSO SOLD IN BULK.

Your jobber can furnish the goods.

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Bridgeport, Conn.

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ZUCKER & LEVETT & LOEB CO.
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SEND FOR CATALOGUE OF
NICKEL & ELECTRO-PLATING SUPPLIES & POLISHING MATERIALS.

One of the Twenty Fire Pots.



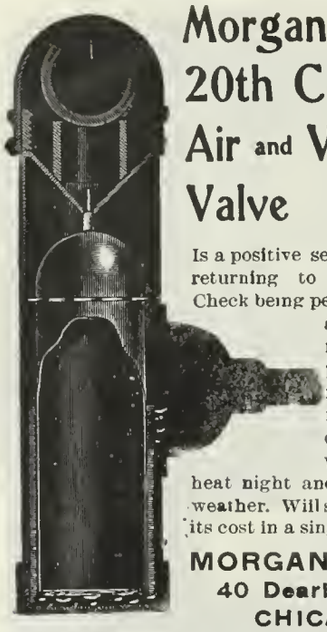
Coil fire pots are well known. Here is one that is sure to please. The tank is made of heavy galvanized iron and is fitted with brass air pump. All parts are interchangeable. Ask your jobber for it.

$3.25 net.

Our name on a fire pot means your money back if it does not please.

Clayton & Lambert Mfg. Co.,
Detroit, Mich., U. S. A.

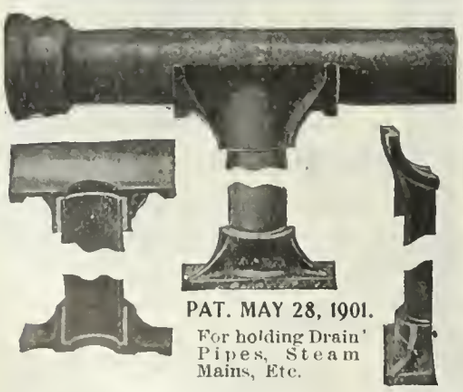
Morgan's 20th Century Air and Vacuum Valve



Is a positive seal against air returning to the radiator. Check being perpetually balanced in water requires no pressure to lift it. A banked fire, with drafts closed will maintain heat night and day in mild weather. Will save four times its cost in a single season.

MORGAN & CO.,
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The Oberle Pipe Support Fittings.

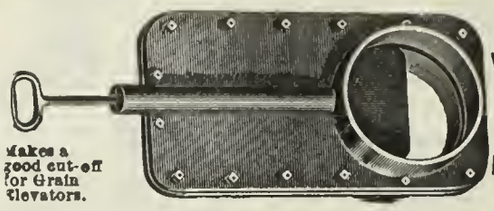


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For holding Drain Pipes, Steam Mains, Etc.

Gives the Plumber and Fitter a chance to use the Waste Wrought and Cast Iron Pipe. The head has the regulation pitch of ¼ inch to the foot and up to 2 inches per foot.

Write for descriptive circular, price lists and discounts, ...

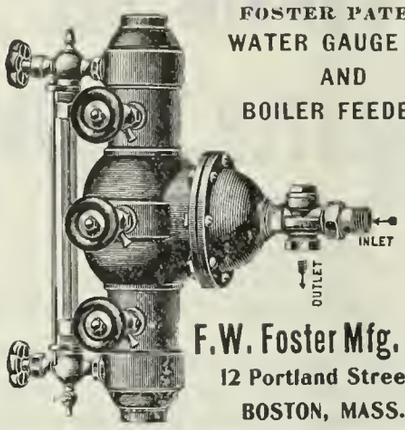
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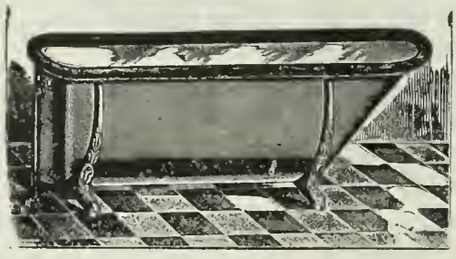
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WATER GAUGE BOX AND BOILER FEEDER.

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Day Metallic Manufacturing Co.,

DETROIT, MICHIGAN,
Manufacturers of
Steel Enamel and Steel Clad
BATH TUBS and HEATERS.

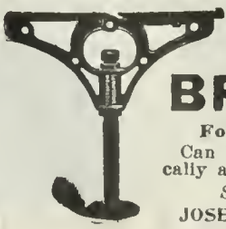


GALVANIZED STEEL and WOOD TANKS.
All sizes and shapes.
J. H. EDWARDS,
59 Park Place, N. Y.

Trimo Giant

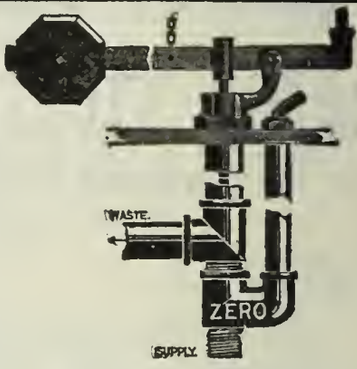


This Chain Pipe Wrench
has interchangeable jaws. Improved method of holding and releasing chain. No locking. Send for catalog.
TRIMONT MFG. CO., Roxbury, Mass., U.S.A.



BOSTON ADJUSTABLE BRACKET

For Sinks and Trays.
Can be adjusted both vertically and laterally.
Send for Circular.
JOSEPH H. YOUNG, Boston.



SAVE HALF

The expense of installing closets by getting

Zero Anti-Freezing Valves.

They can be put in with half the time and half the labor because they do not require a pit or vault.

They are simple and durable in construction—made without screws, springs or pins.

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ALWAYS IN STOCK.

ALL SIZES OF
Galvanized range boilers, expansion tanks and boilers with copper tube coils inside for heating water by steam.

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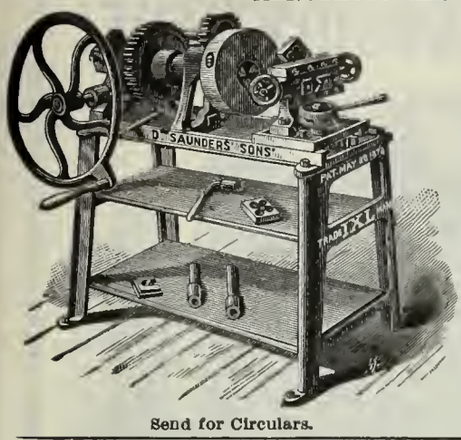
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Manufacturers of
LEAD PIPE, SHEET LEAD, SHOT,
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Everything You Want for Plumbing.

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Plumbers' Force Pumps,
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WRITE FOR CATALOGUE.

D. SAUNDERS' SONS,

MANUFACTURERS OF THE ORIGINAL



TRADE **I. X. L.** MARK

Pipe Cutting and Threading Machine.

Beware of imitations. None genuine without our Trade-Mark and Name.

STEAM AND GAS FITTERS' HAND TOOLS.

Also Patent Wheel Pipe Cutters.

AS SHOWN BY THE CUT.

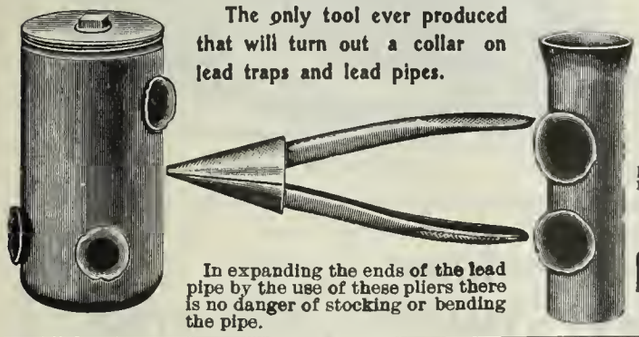
Pipe Cutting and Threading Machines for Pipe Mill Use a Specialty.



Send for Circulars.

27 Atherton St., Yonkers, N. Y.

The Anderson PATENTED. Lead Pipe Expanding Pliers.



The only tool ever produced that will turn out a collar on lead traps and lead pipes.

In expanding the ends of the lead pipe by the use of these pliers there is no danger of stocking or bending the pipe.

"PLUMBER'S BEST FRIEND."

PRICE $1.25.

Send for Discount.

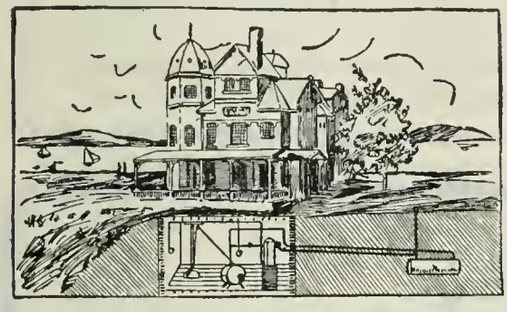
Sample pair sent by mail to any point in the U. S., postage paid, on receipt of price.

Manufactured by

THE

Anderson Coupling Co.

PORTLAND, CONN.



Our remarkable recent inventions enable us to offer the public an intensely brilliant, smokeless gas at much less cost than city gas, better, safer, and cheaper than electricity, and costing but one-fourth as much as acetylene. Most durable and least expensive apparatus to maintain in effective perpetual operation. Gives services of lighting, cooking, and heating, and operating pumping engines. Fullest satisfaction guaranteed, and easy terms. The very apparatus for suburban homes, institutions, etc. We construct special apparatus also for fuel gas for manufacturing, producing gas equivalent to city gas at 50 cents per 1,000 cubic feet, and made to respond to very large demands; also for lighting towns, etc. Cooking by gas rescues a person from the intolerable heat experienced with other stoves. *Send for Catalogue.*

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GEM GASOLINE SOLDERING FURNACES

are ready for use, possessing no offensive odor, no smoke, no noise, simple, powerful, durable, convenient and safe. They stand unrivalled, unexcelled and unequalled in their perfection. Try them.



Burgess Soldering Furnace Co.,

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Thomson Smoke Machine

For Testing Plumbing.

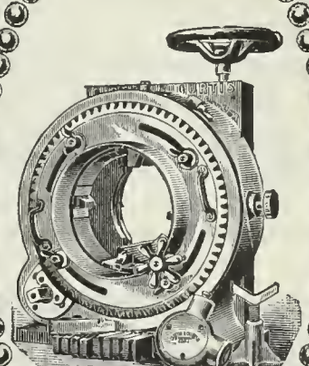
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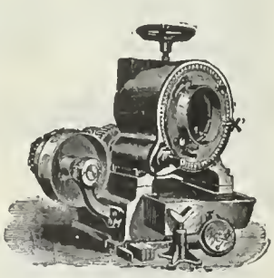
FORBE'S PATENT DIE STOCKS



PIPE CUTTING AND THREADING MACHINERY

FOR HAND OR POWER

Pipe up to 12 inch cut off and threaded by one man with ease.



Send for illustrated catalogue.

THE CURTIS & CURTIS CO.,

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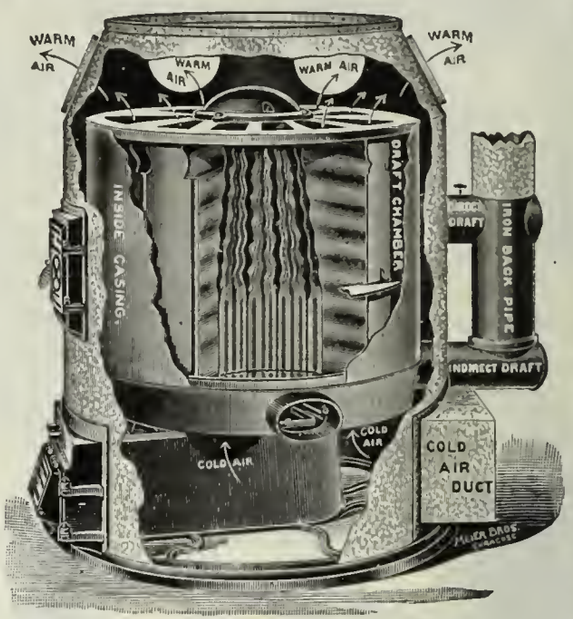
The Kelsey Warm Air Generator.

THE PRINCIPLE

Of the Kelsey is to warm great volumes of air by bringing it into **actual contact** with an **extensive** and **properly heated** surface.

This is accomplished by sending the air in **separate channels through** the long hollow corrugated cast iron sections which form the fire chamber.

This is a far more effective method, and the air is more thoroughly and evenly heated, than by simply **passing over** or **next to** a hot surface.



Sectional View.

Each section has eight square feet of heating surface, and weighs about seventy pounds. There are from nine to seventeen sections in each generator, according to its size. This means a powerful and economical heater, and an abundance of pure warm air. Each section is an independent heat generator, and by capping over one or more, and extending a heat-conducting pipe therefrom, the warm air is forced through long or level pipes to the rooms so connected.

Ask for booklets **"KELSEY HEATING"** and **"OPINIONS."**

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NEW YORK OFFICE, 239 WATER STREET.

COOK & VAN EVERA CO.,
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"THERE'S ONLY ONE WARM AIR GENERATOR, THE KELSEY, AND IT IS PATENTED."



PREPARING

for your heavy orders on Fall goods.

We are determined there shall be no shortage this season. Car after car of material is being worked up for your demands.

Place your orders with us early for Standard Nested Stove Pipe, Elbows, Coal Hods, Shovels and Drip Pans, and you will not suffer for deliveries when the time comes.

If your order Is not already in get it in QUICK.

NATIONAL ENAMELING & STAMPING CO.

BRANCH OFFICES:

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THE METAL WORKER.

NEW YORK AND CHICAGO.

New York, March 22, 1902.

DAVID WILLIAMS COMPANY, - - - PUBLISHERS.

BUSINESS OFFICES:

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ST. LOUIS.....1205 Chemical Building.
CLEVELAND.....312 The Cuyahoga.
LONDON.....Hastings House, Norfolk St., Strand.

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Statutory Ventilation and Sanitation.

Notwithstanding the benefits that have attended the use of the advanced ideas of students which have a bearing on the everyday life of the people, it has been found necessary in many instances to secure the observance of such beneficial customs by the enactment of special laws for the purpose. At the present day the benefits that accrue from the proper ventilation and sanitation of buildings are broadly recognized, yet it has been found necessary, particularly in the case of schools and public buildings, to provide laws which will compel the provision of ventilating and sanitary facilities in the construction of buildings of this class. Such a law has been on the statute books of the State of Massachusetts for a number of years, and for the past two or three years efforts have been made to secure the enactment of a similar law by the Legislature of New York State. The measures presented have only failed of enactment through the rush of business at the close of the legislative sessions, after having been passed by one body, and favorably reported for final action in the other. The heating and plumbing trade are now invited to lend their assistance in securing the passage of the bill which has been introduced this year by Representative Woody of Brooklyn. This aid can be most effectually given by correspondence with their Assemblymen and Senators, requesting them to study the provisions of the bill and urging the matter on their favorable consideration. The present bill is largely the result of the study and labor of C. B. J. Snyder, architect, and superintendent of the School Building Committee of the City of New York. Mr. Snyder is also a member of the Board of Governors of the American Society of Heating and Ventilating Engineers, and he is co-operating with the Legislative Committee of that society, which has been active in working for such a law for several years. The full text of the bill will be found on another page, where its provisions can be studied. In addition to securing the proper ventilation of buildings, the measure, as presented this year, also includes some very necessary sanitary provisions. Another important feature is the provision for protection against fire.

Bills of a similar character have been before the legislatures of New Jersey, Maryland, Pennsylvania and some of the Western States, but as yet have failed of enactment through lack of interest. There is a necessity for missionary work by the trade in this matter, because of the lack of familiarity on the part of the average legislator with the necessity for such legislation in the interests of the general public. No more effective assistance can be rendered to those who are now engaged upon such work than to explain the object and the result to legislators in detail. Without full knowledge on these points, the legislator is apt to consider bills of this character as of minor importance. It has been the experience both in New York and Pennsylvania that such laws fail of enactment simply because other laws are more persistently pushed, and occupy the calendar to the exclusion of the ventilation and sanitation laws. This condition of affairs can be entirely changed in the present case by so simple a method as correspondence with Assemblymen and Senators, urging their consideration of the bills now before the Legislature, or, better still, by personal interviews with the legislators, where this is possible.

Building Activity.

The spring season opens with evidence of an unusual volume of building operations under way or in preparation in all parts of the country. There is every indication of a year of pronounced prosperity for the various trades that cater to or are affiliated with this important industry, including those branches of business to which the majority of our readers belong. While the building record of 1901 was exceptionally good, builders, architects and others directly interested freely predict that 1902 will far surpass its predecessor in the amount and value of its building operations. The fact that prices of some materials are lower than they were a year ago, when a number of building plans were postponed because of their expense, while about all other materials are at least no higher in cost—iron and steel products being about the only building materials that have advanced in the past twelve months—will doubtless stimulate the undertaking of deferred building projects in many instances. A marked feature of the present year's construction is the great number of large structures that are being erected or are under contract in the business centers of the country. Especially is this the case in New York, where a great crop of many storied office and loft buildings, hotels, high class apartment houses and other costly structures is springing up all over the city. These buildings largely take the place of older ones that have been torn down to make way for the more modern constructions. Last year, according to a recent report of the city's Building Commissioner, the aggregate cost of building operations projected in the boroughs of Manhattan and the Bronx was $112,000,000, or nearly double that of the previous year. This amount was made up mainly by large buildings of the class referred to. No less than ten huge business skyscrapers will be completed about May 1 in the small area on Manhattan Island that lies below Fulton street, and as many, or more, are projected or already begun in the same district, which will be completed in the course of the present year. These figures give some idea of the active condition of the building industry in one small section of the metropolis, and this activity is already reflected in other parts of the city and, in a greater or lesser degree, in all the cities and towns of this country, so that the claim made that 1902 will be a "boom" year in the building business seems to have a substantial foundation.

Peddling Ranges.

That particular form of enterprise adopted by some stove manufacturers, which consists in peddling ranges in order to dispose of their surplus product, is not at all appreciated by dealers who maintain an establishment for the sale of stoves. With the approach of spring comes the information that carloads of steel ranges have been received at some of the Western centers, and that already a number of salesmen and teams have been engaged to canvass the small towns and farmers in the vicinity with the object of disposing of the goods. There can be no doubt that the stove dealer who aids in the general distribution and sale of stoves by furnishing to all who visit his establishment more or less information free, as well as an opportunity to examine the stoves, is entitled to substantial protection at the hands of the stove manufacturing trade. A very general feeling exists that those who manufacture should confine themselves to manufacturing and leave the retailing to the retail dealers, and it is probable that the objection raised to the manufacturers who peddle stoves is due to the prevalence of this idea. It is not improbable that self interest rather than enterprise prompts some houses to take up peddling in order to dispose of their product. Still, there is another side to the peddling question. Beyond question the retail trade have received substantial protection for years, and have grown to look upon it as a natural right. In too many instances, however, they have not felt it incumbent upon them to make special efforts to familiarize themselves with new goods and to keep abreast of the enterprise of the manufacturers who bring out new goods with the object of introducing such goods to the attention of their community. This means live, up to date stove selling, and stove dealers of this alert type seldom have their territory encroached upon by the peddlers. Such energetic merchants have no difficulty in receiving substantial assistance from the manufacturers in the shape of advertising matter adapted for attracting the attention of possible purchasers. Even as "eternal vigilance is the price of liberty," so eternal energy and enterprise is the price of enjoying the undivided profits of a large territory.

Water Wasted and Stolen.

For some years past it has been notorious that the water supply of the city of New York was grievously wasted and the municipal revenues curtailed by reason of defective meters, leaky pipes and mains and like causes. It seems, however, that this is not the worst part of the abuse, for the claim is now publicly made by the Merchants' Association that the city has been put to immense loss through water consumed and not paid for. In short, that it has been systematically robbed by collusion between consumers and officials. In a bulletin issued by the association some startling revelations are presented which would justify the impeachment of the former administration of the city. The verdict of the association is that "the city's water is not wasted; it is stolen." While the charge is based upon careful investigation and full information it would probably bear amendment, so far as the denial of wastage is concerned, for the evidence is convincing as to the large number of defective water meters found throughout the city by the present administration after taking charge of the city's affairs. Leaky faucets, leaky pipes and broken mains have also been discovered in many parts which have aided in the criminal waste of water. The indictment, however, in regard to the theft of water is significant. The meters, which are designed to prevent the waste of water, seem actually to have been used for the purpose of covering up fraud. The investigations of the Merchants' Association disclosed the fact that meters have been extensively manipulated or mutilated so as to make them record falsely, a fraud which, it is plain, could not have been carried out successfully for a term of years, unless winked at by the employees of the Water Department.

Commissioner J. Hampden Dougherty, the present head of the Water Bureau, has found a number of meters which by deft manipulation have been made to register only about one-tenth of the water that passes through them. As there are some 37,000 water meters in use in New York City, and the extent of the tampering with the same is believed to be very widespread, it is not surprising that those acquainted with the facts are claiming that the water revenues of the city for the past few years have been from $2,000,000 to $3,000,000 a year less than they should have been if the water supply business had been honestly conducted. In addition to tampering with the water meters the Merchants' Association claim that frauds upon the city have been perpetrated by false reports by inspectors of the actual quantity of water registered by meters, by false entries of quantities upon the books of the water register, and by secret service pipes or by-passes, which divert a large portion of the water actually used, so that it does not pass through the meters. Everything that has been disclosed in connection with this matter emphasizes the fact that the system of water supply and registration in New York City needs to be thoroughly renovated all the way through, and protected from both careless waste and wanton fraud. The water meter system was originally inaugurated under the Tweed *régime*, and the claim is made that it was deliberately put in with the idea of defrauding the city and providing a lucrative revenue to dishonest officials. Should the present city administration succeed in correcting this abuse it will earn the thanks of the community, and also add considerably to the city's revenue.

Mr. Swank's figures of the production of Bessemer steel ingots for the year 1901 are startling in their magnitude, showing as they do an increase from the banner year 1899 of 1,126,948 gross tons, while the increase over 1900 was 2,028,532 gross tons. To the 8,713,302 tons of Bessemer steel made in 1901 must be added the output of open hearth steel, for which the American Iron & Steel Association has not yet published the figures. In 1900 the production was 3,398,135 gross tons. It would be surprising if the two together for 1901 did not reach 12,500,000 gross tons—a stupendous total.

THE IRON SHORTAGE.

Stray consumers of foundry iron are feeling the scarcity of metal quite keenly, and are forced to pay several dollars per ton premium for what they must have immediately. But of the whole tonnage which goes into the cupola, the converter and the open hearth furnace this is an almost infinitesimal percentage, the great mass of iron which is being melted being delivered on old contracts at fair rates. The same is true of steel. In times like these perspective is distorted, and much is made of what are comparatively trivial circumstances. It would, of course, be rash to deny their significance, which is that our home consumption is enormous, and that it slightly outbalances production. The balance would quickly swing in the other direction, however, if consumers got it into their heads that prices are abnormally high. While they are remunerative they are not unreasonable, nor is it likely that the shortage now so keenly felt will last more than 60 or 90 days.—*The Iron Age.*

The Furnace Work Record.

ITS USE AND RECEPTION.

Those who take an active interest in the advancement of furnace heating and who favor more scientific methods in the designing of furnace work will be pleased with the reception given to the furnace work record presented in *The Metal Worker* of March 8. It has been known to us that there were men in various sections of the country who, by a close study of their furnace work and methods, were enabled to make a success of every furnace heating plant installed under their supervision. It was also known that these men were eager to compare their experience with that of others, but for obvious reasons the opportunity to do this in person had not presented itself. The nearest approach to it was when the subject of furnace heating occupied so much time in the discussions at the annual meeting of the American Society of Heating and Ventilating Engineers in New York this winter.

The chart presented in *The Metal Worker* was designed purely as a suggestion, and it was expected that it would evoke comment both of a favorable and unfavorable nature. We are not surprised that there are many furnacemen who are willing to let well enough alone, and who seem unwilling to make any effort or take any trouble in devising rules or aiding in the preparation of data that will be of benefit to the whole trade. To those, however, who have shown a progressive spirit we extend our congratulations, and to those who are somewhat skeptical we offer encouragement, with the conviction that the furnace work record will benefit many in the trade, even if the good may not be enjoyed directly by all who are engaged in furnace work. Some correspondents have already made suggestions for changes in the record, others suggest supplemental charts, and a few have been good enough to return the charts sent to them with a tabulation of some of their work, which will be presented in an early issue. This evidence that there are some who are willing to go to the trouble of filling in the charts sustains our opinion that it was worthy of presentation. We still have a limited number of enlarged charts which we can furnish to those who desire to make use of them.

FAVORABLE COMMENTS.

With the usual custom of favoring those who agree with our views, we present the most favorable opinions first. At the same time we believe that benefit can always be derived from reading the other side of the question. The less enthusiastic views follow, so that whatever may be said on either side of the question may be duly considered by those most interested:

PROF. J. H. KINEALY, WASHINGTON UNIVERSITY, ST. LOUIS:

> I have received a copy of your record of furnace work and congratulate you most heartily upon the completeness of this record. I feel that you have made a step in the right direction toward getting valuable data for furnace work. Furnace work has not had the right kind of attention given to it, and yet it is one of the most important works in connection with heating. Furnace work has gotten rather a "black eye," because furnaces have been installed with so little regard to the work which they will be called upon to do, and with so much regard to skimping and cutting down the cost of installation; the result is that furnace work has come to be looked upon as the cheapest and worst kind of heating work. I cannot see any justification of this, and I therefore am very much pleased to see what you are doing to put furnace work upon a proper footing, and to have it occupy its proper and legitimate place in the work of heating and ventilating buildings.

PROF. R. C. CARPENTER, SIBLEY COLLEGE, CORNELL UNIVERSITY, ITHACA, N. Y.:

> I am much pleased with the idea presented by your blank for furnace work. I inclose it filled out for one job. If you will kindly send me one or two additional blanks I will try and get some more information. The blank is, in my opinion, neatly worked out, and I hope you will succeed in getting enough reports to work up some general laws as to furnace practice.

MARTIN L. KAISER, WILKES-BARRE, PA.:

> Yours of the 8th inst. with blank furnace record received. I have not been able to give the matter much thought, but think the idea very good. The plan has been pretty carefully worked out, but I will offer a few suggestions any way. I think the explanation of E. G. S. rather ambiguous and would substitute, "the E. G. S. equals the glass surface plus one-quarter the wall surface." An extra wide column for general remarks would be an improvement, I think. Perhaps the first column could be widened for the purpose. Next to the column for size and area of fresh air supply I would place a column for area of air passages in the furnace. If it is good for nothing else it would at least call attention to an important item often neglected.
>
> According to excellent authority 12 square feet of floor over unheated basement is equal in cooling power to 1 square foot of glass, and 10 square feet of ceiling under an unheated attic is equal to 1 square foot of glass. The proportion of such cooling surface is much greater in a two-story building than in a four-story building. If this surface is taken account of and added to the glass surface the blank ought to be of much value in planning sizes and capacities of apparatus. A few clear cut, simple rules for determining the grate area, stack area, heating surface, &c., for different classes of buildings, based on the E. G. S., might be of use in planning new work. Whether these suggestions are of any value to you I do not know, but I gladly accept your kind offer to send a few additional blanks, either amended or in their present form. I can see that too much elaboration will make the blanks so bulky as to be unwieldy. If the blanks could be largely introduced many furnacemen would learn much of importance.

MARTIN FISHER, BUFFALO, N. Y.:

> We commend your enterprise in gathering information of this character, which cannot but prove beneficial to the trade at large. We have heated a very large number of fine dwelling houses in this vicinity with the best of success, and will be pleased at some near future time to contribute some of the knowledge so gained.

GEORGE J. PALMER, WEST CHESTER, PA.:

> I have never kept a record of furnace work such as you suggest, but would consider a table containing data of this kind very valuable to furnacemen. Some of this data, such as "heating surface," would necessarily come from a manufacturer of furnaces. The balance would require careful measurements on the part of the furnaceman.

EISENBISE & BROTHER, CHESTER, PA.:

> We approve of the general idea, as referred to in *The Metal Worker*, but unfortunately we have never kept any record of heating systems we have installed, and we have not time to go over them.

E. B. MESSER & SON, HARTLEY, IOWA:

> We do not do much hot air work, ours being almost entirely water and steam. It has been two years since we put in a hot air job, but we think that one somewhat similar would be of service for air, water and steam. We would fill out your blank if we had preserved the figures, but we did not.

W. J. WOODALL, CONNELLSVILLE, PA.:

> In our opinion such a table as you propose would be a benefit. It would be made use of by a great many furnacemen, and we think would be an aid in better proportioning the whole furnace system and in that way help all who are engaged in the business. We would advise the addition of a note such as "Increase grate and radiating surface, say 25 per cent., for every 12 degrees below zero." We wish you every success in your effort to better this important branch, which so many of us have at heart.

GIBLIN & CO., UTICA, N. Y.:

> We think the blank prepared is a good one, and great benefit would accrue to the furnace trade, both manufacturers and dealers, by the use of this blank and making comparisons of the working of the same furnaces under different conditions. We would suggest that, in addition to the heading given, the following would be of benefit:
>
> 1. Street and number of building.
> 2. Diameter of furnace fire pot.
> 3. Diameter of furnace casing.
> 4. Days furnace was in use.
> 5. Lowest temperature during the season.
> 6. Average temperature while in use.
> 7. Velocity of air in registers.

CHARTER OAK STOVE & RANGE COMPANY, ST. LOUIS, MO.:

We would suggest, if not too cumbersome, have more room left for information concerning fuel, flue and draft in flue, and for hot and cold air pipes—express in fractions of an inch of water.

LENNOX MFG. COMPANY, MARSHALLTOWN, IOWA:

We consider the blank for keeping record of furnace work of value and think that the form that you have is quite complete. There is one thing that we do not notice on the blank that is of vital importance where outside cold air is used, and that is the size and nature of the ventilating flue. We use outside cold air connections in this country but very little, if any, and in fact do not understand the advantage of using the outside air without the use of a ventilating flue. We can conceive of no way that this will increase the circulation of the air within the building, and this certainly is an important thing, and the thing that the success of the hot air furnace depends upon. The circulation can be obtained in two ways: One by the use of a ventilating flue to remove the air off the floor of the building and supply the furnace with cold air from the outside, and the other by a return system, which consists of supplying the furnace from the cold air on the floor of the building. With this system we know nothing of the experience that is very common where outside air is used, without sufficient ventilating flue—namely, that of the house being heated on one side one day and on the other side the next day. With a good circulation of air, which can be obtained by placing a cold air face in the floor or baseboard of each room, this never occurs.

COOK & VAN EVERA COMPANY, CHICAGO, ILL:

We thank you for asking our opinion and idea in regard to detail furnace work, but we are not manufacturers and could not give the many inquiries you outline in your blank the proper attention. All the furnace manufacturers and jobbers are deriving great benefits from the detailed descriptions and information contained in *The Metal Worker*, as they are becoming better educated on furnace work and are more prepared to install furnaces in such a manner that the operation of the same will be satisfactory to the consumer. We cannot understand why any retail furnace or hardware man should neglect to subscribe for your valuable paper and be at all times posted and familiar with the work they may be called upon to do in their own line—the furnace business.

CHARLES C HEATH & CO., BALTIMORE, MD.:

The blank for keeping a record of furnace work is very good indeed. We have not the time just now to go into this in detail, but it possibly could be improved in some ways, and yet from a glance at it we think it is excellent as it is.

THE PRIZER-PAINTER STOVE & HEATER COMPANY, READING, PA.:

The blank for use of furnacemen is very complete and should be appreciated by all furnace dealers. We have no suggestions to offer, as it is about as complete as it could be made, but we will give you the names of a few furnacemen who might be glad to comment upon the situation.

THE SCHILL BROTHERS COMPANY, CRESTLINE, OHIO:

The Metal Worker record of furnace work is certainly very complete, and we see nothing that we could suggest in the way of improvements on same.

THE NATIONAL PIPE BENDING COMPANY, NEW HAVEN, CONN.:

We think the idea would be all right if anybody will take the trouble to carry out the specifications referred to, but we are afraid that very few people will go to that trouble.

H. ADLER COMPANY, PITTSBURGH, PA.:

As we are not directly in the hot air heating business we are not able to suggest improvement in your record of furnace work, although we believe a record of this kind would be a splendid thing.

PITTSBURGH STOVE & RANGE COMPANY, PITTSBURGH, PA.:

After examination we consider the record would be of value to a retailer in the furnace business, making a very complete and accurate record of the various contracts complete which would be of great benefit to him.

ABRAM COX STOVE COMPANY, PHILADELPHIA, PA.:

We would say that the blank for record of furnace work is a very good thing, and possibly to add anything to it might make it too complicated.

FLOYD, WELLS & CO., ROYERSFORD, PA.:

We cannot suggest anything of advantage, as we believe you are better fitted in your office for that than we are.

CLARENCE M. LYMAN, UTICA, N. Y.:

The blank for record of furnace work is deserving of careful study and consideration. The idea presented is a good one, and in the hands of careful investigators would prove of great value, provided all the data could be obtained, but here is where one difficulty will be encountered, I fear. Manufacturers who can or will furnish the heating surface of their product are few and far between, and the average contractor has not the time, and will not make the effort, that is necessary for him to be able to measure the surface for himself. Again, the item of coal burned for a season is an extremely difficult one to obtain, in spite of the glowing testimonials that are published to exploit different heaters. It is only here and there that there is a man in the furnace business who can readily figure out the details in most of the remaining columns. I speak feelingly on the point, for in spite of all the constant repetition in good furnace makers' catalogues that the cold air supply must equal two-thirds or three-quarters of the area in the hot air pipes in cross sections, I am constantly appealed to for information as to how large a cold air duct there must be for this or that job. If furnacemen are at sea on such little matters, I am afraid they will hopelessly flounder on glass area, equivalent glass surface and proportions. I wish I could fill out the blank as requested, but as I have no record and my work consists largely in giving aid to others I seldom hear of a job after it is installed, unless it fails to give satisfaction. I hope, however, that other furnacemen may be more fortunate and that these records will be kept and filled out, that we all may have the benefits of them by having them sent to *The Metal Worker* for publication for the general good of the trade later on.

Many houses, without comment, have sent names of furnacemen to whom they desired the blanks to be sent.

LESS ENTHUSIASTIC VIEWS.

Inasmuch as it might prove embarrassing to some, who from their comments on the furnace work record certainly cannot be considered enthusiastically in its favor, we have withheld their addresses in connection with the comments which they have made.

A Western furnace manufacturer writes:

In reference to the furnace record blank I, for one, would not advise printing them, they not being practical. It would take too much work to figure out the data necessary to fill the blanks. The conditions never come alike, and the results obtained in one job are not certain in a second. The operation of the furnace must be taken into consideration. A person competent to figure on work does not especially care for the results obtained by another, and if his own is a failure the knowledge obtained through the record would be too indefinite to help him out. I regret that I cannot write more encouragingly.

An Eastern manufacturer writes:

After due consideration of your blank on record of furnace work, we are afraid that there is too much to this blank to interest the average man who does furnace work, and question if it would be popular with this class of men.

A Western house write:

Concerning the record or reference sheet, we would say that it may be all right, but life has been too short for us up to the present time, and it will be henceforth, to bother with a thing of this kind. We have not gone very far into details, but it seems to us that furnacemen, if they are doing any furnace work of consequence, would hardly have the time to keep a record of this kind.

An old furnace manufacturing house write:

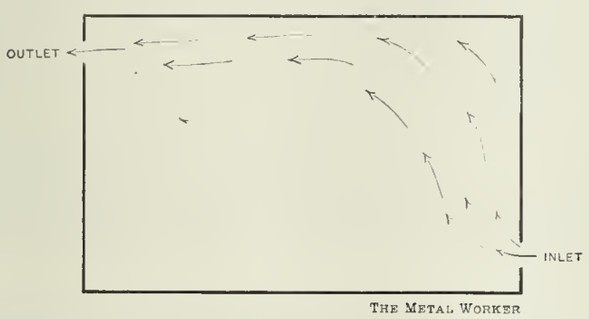
We have examined the furnace record blank very carefully and think such a record would be of considerable interest to many furnace concerns, but we cannot see that it would be of any great value, as in the majority of furnace jobs the conditions are very simple and require no such elaborate calculations. Furnace work, for the most part, is not an

exact science and does not require such fine mathematical calculations as the form indicates. At least nine out of ten furnace dealers could not fill out one of these blanks if they should try for a week. We therefore do not think this blank form would really be of any great practical value. It certainly would not be to us, and for that reason we doubt if it would be to many others. We take it for granted that you wish us to give you a frank statement of our views, and have done so.

AN EASTERN COMMENT ON THE ROTARY SYSTEM.

BY R. R. M. C.

In *The Metal Worker* of March 8 there appeared an article by "Iowa" on furnace heating. While there were a great many good points in this article, I beg to differ with him on a couple of his statements. First, he



An Eastern Comment on the Rotary System.—Fig. 1.—Showing Air Movement Due to Location of Registers.

speaks of "the old idea of taking cold or fresh air from out of doors?" Where, pray, would we go for fresh air if we did not go out of doors for it? Take a school room, for instance, occupied by 50 pupils, heated by the warm air "rotary" system, as explained in the above

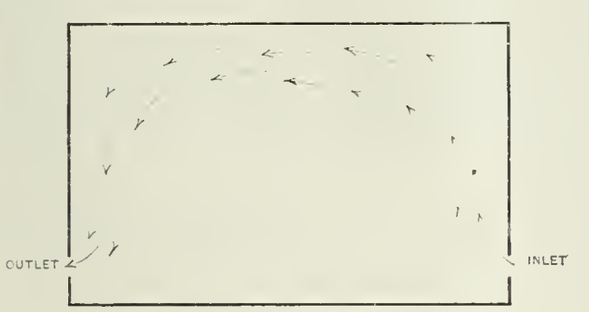


Fig. 2.—Air Movement with Different Location of Registers.

mentioned article. Say, for instance, in the morning, when the pupils first assemble in the room, the registers are all opened to admit heat. In R. C. Carpenter's book on "Heating and Ventilating," the allotted time for contaminating the air in a school room, where each child is

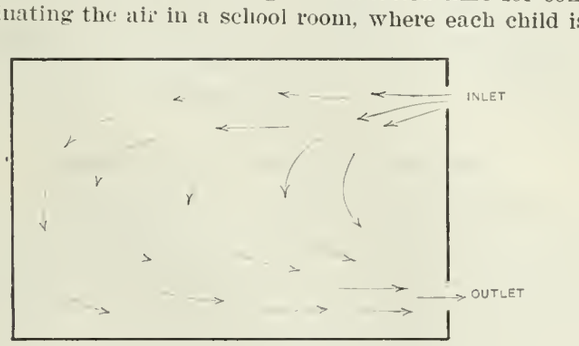


Fig. 3.—Diffusion of Air through Best Location of Registers.

allowed 130 cubic feet of space, is eight minutes—that is to say, in eight minutes after the children enter the room the air is contaminated.

Now, according to "Iowa's" idea, this contaminated air is passed through the return ducts down to the furnace to be heated, and again passed into the room to be breathed over by the 50 pupils. By noon, allowing three hours of school to the morning session, this same air will be breathed over about 22 times. No; I think if Mr. "Iowa" were to introduce his rotary system of furnace heating into an Eastern school building he would meet some reverses.

Again, Mr. "Iowa" speaks of the placing of ventilating registers near the floor as a wrong idea, and says that the theory that carbonic acid gas is heavier than air is incorrect. In the first place, if he will look up the matter he will find that a given bulk of carbonic acid gas at 62 degrees weighs 0.11631 pound, and air at the same temperature weighs 0.0761 pound. When the carbonic acid gas breathed from the lungs mingles with the air it, being heavier, will most assuredly fall to the floor.

Again, if the ventilating register is placed near the ceiling on the opposite side of the room the movement of the air current will be that shown in Fig. 1, none of the incoming air reaching the lower part of the room. If the outlet is placed at the bottom of the opposite side of the room the movement will be as shown in Fig. 2, the incoming air again missing the lower portion of the room, except where the air enters and leaves the room. Now if the register through which the air enters is placed about 8 feet above the floor and the ventilating register at the floor on the same side of the room the children sitting near the register will suffer no unpleasant effects from the incoming air, and the perfect circulation will take place as shown in Fig. 3.

"Iowa's" idea of rotating the air is certainly an excellent one, and one we use right along, but a large amount of fresh air from out of doors is also a great necessity.

The American Stove, Range & Foundry Company.

The Memphis, Tenn., parties who bought in the South Pittsburg Stove & Foundry Company's plant at South Pittsburg, Tenn., when it was sold by auction last month, are pushing repairs on the plant rapidly, preparatory to starting work on April 1. The proprietors have incorporated under the name of the American Stove, Range & Foundry Company, with C. C. Huntington of Memphis as president, T. G. Garrett of South Pittsburg as vice-president, and John J. Bowers, secretary and treasurer. The company are capitalized at $120,000. The plant has a capacity of 40,000 stoves per annum, and foundry room for 150 floors. It originally cost, when built by the Perry interests of Sing Sing, N. Y., $250,000. The new owners claim that they will run it to its full capacity. A cast iron soil pipe plant was a part of the old foundry, and this will also be operated at an early date. When in full working order about 300 hands will be employed.

The Wireton Heating Company.

A new location has been selected by the Wireton Heating Company, manufacturers of furnaces and other house heating apparatus, time draft regulators, &c., whose plant, at Blue Island, Ill., was burned last month. The company have purchased 5 acres lying between the works of the Baldwin Piano Company and the Sheldon-Foster Glass Company, at Chicago Heights, Ill. The railroad facilities of this location are highly advantageous, as the section is traversed by five separate lines of railroad, including belt lines, which connect with all railroads running out of Chicago. The company will build a plant which will greatly exceed the capacity of their old works. They have decided to erect five buildings, consisting of a foundry, 80 x 150 feet; machine and tin shop, two stories high, 50 x 250 feet; pattern shop, two stories high, 50 x 80 feet; boiler and engine house, 50 x 80 feet, and warehouses, 100 x 200 feet. These structures will be of brick, stone and mill construction. They will be equipped with the most improved modern machinery. The company hope to have their plant ready for manufacturing operations by July 1. They had operated their plant at Blue Island for over 12 years, and had built up a large business, which they confidently expect to greatly increase at their new location. M. Austin is president of the company, E. A. Billings is vice-president, A. C. Cattrell is treasurer and E. H. Heald is secretary and manager.

Jewel Gas Stoves.

The 60-page catalogue of Jewel gas stoves which has just been issued from the press by George M. Clark & Co. of Chicago, Ill., is in its general style and make up similar to the one noticed in these columns a short time ago, covering the manufacturers' line of gasoline goods. The typographical make up is a good example of the printer's art, and the binding is in covers of unique design. The Jewel gas ranges are shown in great variety and adapted to meet requirements both large and small. Such descriptive particulars are given as to render the construction readily understood, and the matter is presented in such shape as to be of the most value to the dealer, as well as of interest to the prospective user of gas stoves. Attention is given to the Jewel gas circulating water heater, showing how it may be utilized for hot water for the kitchen or laundry, as well as for the bath; the Jewel hot plates, broiling stoves, tailors' iron heaters, laundry stoves, baking ovens, gas tubing, burners and other fixtures. Some suggestions are given relative to repairs for Jewel goods, and a comprehensive index is a concluding feature of convenience.

ODD PLATES.

The Alganite Stove Company of St. Louis, Mo., have been incorporated with a capital stock of $5000. John R. Wettstein, Charles R. Fife, and John P. Nevill are the incorporators.

The regular monthly meeting of the Stove Dealers' Association of Washington, D. C., was held last week, when the question of a new agreement with the wholesale dealers was discussed without definite action. A committee consisting of Messrs. Pierpont, Mathy, Doyle, Sauer, Dodson, March and Hammond were appointed to arrange for the annual banquet of the association, to be held on April 2.

Max Schultze, who has been in the hardware business at San Antonio, Texas, for many years, is reported as being associated with a number of capitalists of Milwaukee, Wis., for the purpose of establishing a Stove foundry at Monterey, Mexico. The demand for Stoves is said to be constantly increasing in Mexico, and it is believed that favorable conditions exist for their manufacture in that country.

The Progress Furnace & Stove Company, Springfield, Ohio, are contemplating the erection of an addition to their plant.

W. H. Colebrook, Sons & Co. of Syracuse, N. Y., marked the advent of St. Patrick's Day by the distribution of a card in which was fixed a neat shamrock button hole, with the legend, "We want to button hole you and land that Cement order," referring, of course, to Colebrook's Asbestos Furnace Cement.

The Art Stove Company of Detroit and Chicago announce to their friends in the Northwest that they are showing a full line of samples of Laurel Stoves and Ranges, at 300 and 302 Third avenue, North, Minneapolis, Minn., where they also carry a large stock of these goods. The branch is under the management of William H. Kirk, who will take pleasure in showing the improved and desirable line that the company are offering for 1902.

The Enterprise Foundry Company, Bristol, Tenn., manufacturers of Stoves and Hollow Ware, desire to receive catalogues of Stove Supplies. In addition to their manufacturing business the company are prepared to repair all kinds of machinery.

Charles Koll, for many years past connected with the Victor Stove Company of Salem, Ohio, has been appointed manager of the Enterprise Stove Company of Vincennes, Ind. Mr. Koll, who assumes his duties at once, brings to this new position an experience extending over many years in the Stove manufacturing business.

The S. M. Howes Company, manufacturers of and manufacturers' agents for Stoves, Ranges, Furnaces, Refrigerators, Fire Place Fixtures, &c., have recently greatly improved the appearance of their stores at 40, 42, 44 and 46 Union street, Boston, Mass. The ground floor store has been redecorated and the stock arranged in an attractive manner. The offices of the managers are on the second floor, and have been changed about with a view to facilitating the transaction of the growing business of the concern.

The Pittsburgh Stove & Range Company, Pittsburgh, Pa., will ask for an amendment to their charter, to permit the sale of property. This step is being taken in order to further the company's plans for the concentration of their plants at Beaver Falls, Pa. A number of the foundries taken over by the consolidation have been dismantled, and it is believed that by the concentration of their forces many economies of management and manufacture heretofore impossible would be secured. The majority of the Stove plants purchased by the company are old fashioned and some of them badly located, consequently their operation was in many cases found unprofitable.

Under date of March 15, F. M. Borden & Co., 118 North Second street, Philadelphia, send to the trade an announcement that their salesmen will soon call in the interest of Gas Ranges, Gas Hot Plates, and other summer goods. Special attention is directed to the Big Four Gas Ranges, and the Ideal and New Process, with ovens and broilers.

A Torrid Sunshine Hot Air Furnace, made by Orr, Painter & Co., Reading, Pa., painted a vivid green, adorns one of the corners at Beekman and Pearl streets, New York City.

M. Travilla of Quincy, Ill., is distributing among his friends in the trade a little pamphlet of pocket size, illustrating and describing the Rattler Air Tight Heater, which he manufactures in several sizes. The Stove is made with polished steel body, lined with heavy steel. A heavy iron brace across the top prevents buckling of the drum from heat, while a check draft on top prevents puffing. Accompanying the illustrations are tables showing the sizes in which the Stove is made, its hight, width, shipping weight and net price. The Rattler Oak is also shown, designed for using coal or wood.

The Doyle Air Burner Company are building a factory at Joliet, Ill., for the manufacture of Stoves on the Doyle air burning principle. Steps are also being taken to establish a factory at La Crosse, Wis., for the same purpose.

The Liberty Stove Company of Philadelphia, Pa., have been incorporated with a capital stock of $100,000 for the purpose of manufacturing Stoves and Furnaces.

The American Stove Company of Jersey City, recently incorporated under New Jersey laws with a capital of $5,000,000, have been incorporated in Illinois with a capital of $250,000.

The Chattanooga Stove Company, Chattanooga, Tenn., are about to erect an addition to their plant in the shape of a four-story building, 50 x 150 feet.

American Hardware Corporation.

The details have been completed by which the interests of the great hardware manufacturing concerns of P. & F. Corbin and Russell & Erwin Mfg. Company, New Britain, Conn., have been merged into the American Hardware Corporation. These details were formally completed at a meeting of the directors of the constituent companies, held in New Britain, at the office of P. & F. Corbin on the 13th inst. The following are the board of directors of the new corporation: Hon. Phillip Corbin, Andrew Corbin, Charles M. Jarvis, Charles H. Parsons, Charles Glover, George J. Laighton, Andrew J. Sloper, Howard S. Hart, William G. Smythe.

The Board of Directors chose the following officers:

President, Hon. Philip Corbin.
First Vice-President, Charles M. Jarvis.
Second Vice-President, George J. Laighton.
Treasurer, A. J. Sloper.
Assistant Treasurer, Charles E. Wetmore.
Secretary, Theodore E. Smith.

Pennsylvania Retail Hardware Dealers' Association.

Under date of March 12 the following circular relating to the meeting next week of the Pennsylvania Retail Hardware Dealers' Association has been issued:

The Pennsylvania Retail Hardware Dealers' Association will meet at the Monongahela House, Pittsburgh, March 26 and 27.

You are cordially invited to attend these meetings, and if you are not already a member we hope that it is not because you think such organizations are unnecessary.

The truth must be forced upon us that there is only one force mighty enough to cope with the powerful influences that are operating to undo us, and that is the combined forces of the retail dealers of the country.

It is useless for the few to make their protests against these evils. We must plan as great conquests are planned, and unite, as by co-operation only great victories are achieved.

We need your help. Will you be present at these meetings?

Please reply promptly on the inclosed postal card, as the Committee on Entertainment desires to complete its work.

J. F. FRYE, Secretary.

J. E. DEGBY, H. F. ROBINSON, G. F. RUDOLPH, Programme Committee.

This circular is being sent to all retail hardware merchants in the State whose names the association has been able to secure. If any are missed it is not by design, as the officers desire, if it were possible, to have every Hardware retailer in the State at the meeting, or at any rate a member of the association. Arrangements have been completed by which it is expected a very interesting and profitable meeting will result, with, it is hoped, a large accession to the membership. Any further information desired in regard to the gathering may be obtained from the secretary, J. F. Frye, Charleroi, Pa.

California State Retail Hardware Association.

The first annual meeting of the California State Retail Hardware Association was held in San Francisco on March 10 and 11. Delegates representing the five local associations of the State were present. Mayor Schmitz of San Francisco welcomed the dealers to that city. The following officers were elected for the ensuing year: President, O. F. Sites, San Francisco; vice-president, A. F. Gutman, Germantown; secretary, Henry Gracey, San Francisco; treasurer, H. C. Bennett, San Francisco. Executive Committee: C. W. Bennett, Fresno; Mr. Turner, Modesto; E. A. Eaton, Salinas; J. W. Baxter, Watsonville; W. L. Lutz, Santa Ana; E. C. Dawe, Santa Barbara; John C. White, Marysville; A. L. Nichols, Chico; S. Armstrong, San Francisco, and M. Brown, San Francisco.

The State organization comprises the following associations: The San Francisco and Oakland Retail Hardware Dealers' Association, the Pacific Retail Hardware Dealers' Association, the Central Retail Hardware Dealers' Association and the Southern Implement and Hardware Dealers' Association.

On the second day of the session conferences were held with the Pacific Coast Hardware and Metal Association, the jobbers' organization. The results have not been made public, but it is given out that arrangements were made by which the friction between the retailers and the jobbers will be largely removed.

ENAMELED WARE IN ENGLAND.

A spirited controversy is now taking place in England as to the advantages of good enameled ware and the delcterious effects of inferior qualities. In this connection our London correspondent writes:

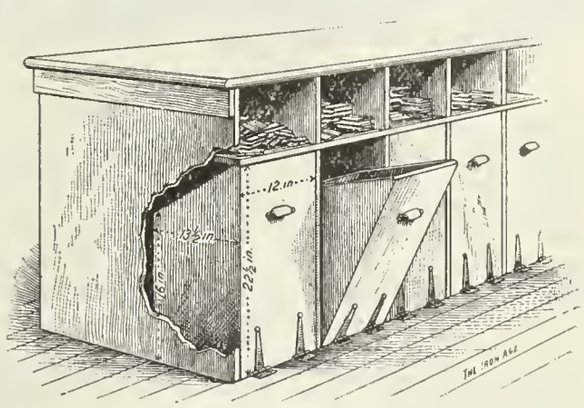
"The Cannon Iron Foundries, Limited, state that, besides the risk arising from enamel lined articles of unsatisfactory quality, there is another prolific source of food contamination in the use of cooking utensils, such as common fry pans and tea kettles, which are manufactured in enormous quantities, lined with an alloy of tin and lead, but with the latter to a very large extent predominating. This is, of course, a very serious statement to make, but the company sign their own name to it. It must be remembered also that large quantities of enameled ware are sold to the public institutions of this country. A friend of mine, who has been in this trade for 20 years, has been good enough to write me something of his experience. He says:

"'The ironmonger who stocks the cheap, badly glazed enameled ware runs a grave risk, and on no account when tendering to a public institution should include it. In the event of an accident he will be held responsible morally, if not legally; his reputation will be damaged and a scare created. When sending in his specification he should set out in good, bold writing that what he is quoting is guaranteed from anything deleterious. The German manufacturer who supplied my old firm with the enameled ware which I introduced all over this country not only gave them a guarantee of purity, but assured them that if he produced anything in his manufactory likely to be injurious to the health of his countrymen he was liable to imprisonment and to have his property confiscated. An important question arises here: Who is flooding the market with the tea shop and bazar rubbish? If German, it is fair to assume that the penalties I have quoted do not apply to export goods. If English or Scotch, they cannot possibly give the guarantee to their customers without imperiling themselves. Prior to the glaze being put on the enamel is porous, and unless these small pores are filled up by the glazing they retain portions of the last food or chemical used in them, however well washed. So you will see how absolutely necessary it is for the articles to be well glazed, and this process being the most costly of all in the manufacturing, cheapness can only be brought about by lack of quality. The English enameled ware trade is in its earliest infancy and cannot possibly help progressing, as slowly but surely it will squeeze even the cheap tinware out when the British makers have got the right plant for making the blanks. Many of the so-called English lists of enameled ware are mainly made up of foreign goods. Further, this ware will supersede tin. To illustrate a case, we have had in daily hard use at home three enameled German saucepans for upward of ten years, and, as far as one can judge, they will last a few more years. How many tin ones, however good the quality, should we have worn out in the same time? The bulk of the tin plates made now are positively useless for wear. If an English manufacturer could make me certain shapes I could enumerate in enameled ware I could command sales by just putting the articles before my customers and allowing them to appeal to their common sense.'

"As it has been admitted all round that the American enameled ware is at the present time the best made, American makers should use this discussion by way of an advertisement, which I am convinced would bring them good results."

Counter for Nails, Butts, Hinges, &c.

A counter for holding nails, butts, hinges, &c., in the store of Herbert T. Clark, Willimantic, Conn., is shown in the accompanying illustration. As will be seen, the bins are placed on the store floor, to which



A Counter for Nails, Butts, Hinges, &c.

they are hinged in front. These bins are 12 inches wide, 13½ inches deep, 22½ inches high in front and 16 inches in back. On the front of each of these is placed a handle by which it is pulled down to allow nails to be taken out. Above the nail bins are compartments for holding butts, hinges and similar goods. It is claimed that this is a very convenient and compact way of accommodating this line of goods.

BENJAMIN W. CLARK has sold his retail Stove and Tinware business, at North Abington, Mass., to Edward Monehan.

The Triumph Fruit Can Wrench.

The Forbes Chocolate Company, 229-233 Sheriff street, Cleveland, Ohio, are offering the fruit can wrench herewith shown. It is stamped out of sheet steel and riveted together. The top edge of the can cover is firmly grasped in such a manner, it is explained, as not to break the top of the can, as the wrench cannot drop lower than ¼ inch, which prevents it catching the glass. Among the points of excellence claimed for the wrench by the manufacturers are the following: That it will not break the can or the cover, that it will not slip or become worthless from long usage, that it saves

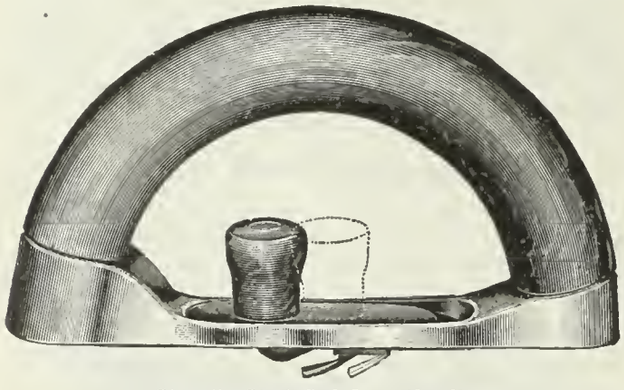


The Triumph Fruit Can Wrench.

cans, rubbers and covers, that it insures the fruit being properly sealed during the canning season, and that it saves many times its cost each year by preventing the imperfect sealing of fruit jars.

Stuart's Steel Sad Iron Handle.

The Milwaukee Automatic Machine Company, Milwaukee, Wis., are manufacturing Stuart's steel sad iron handle, which is herewith illustrated. This is a handle of new construction, the metal part being made of a steel stamping, which is unbreakable. The gripping device is so constructed that the handle is forced in place on the sad iron without touching the knob. It is released



Stuart's Steel Sad Iron Handle.

by sliding the knob backward, as shown in the dotted lines in the illustration. The grip, it is claimed, will not wear loose. The steel portion of the handle is nickel plated. The handle is so constructed as to fit any Potts iron.

Columbian Enameling & Stamping Company's New Plant.

The Columbian Enameling & Stamping Company, Terre Haute, Ind., is the name of an organization recently formed to carry on a manufacturing business in high grade enameled kitchen and house furnishing goods. It is really an outgrowth of what until December 31, 1900, was the Bellaire Stamping Company, Harvey, Ill., an old established business, whose plant on the date named was destroyed by fire. They are prepared to resume business where the old company left off and will place in the market again all of the goods made under the Bellaire Company's patents and registered trade-marks. They have the former expert employees of the Bellaire Stamping Company, and expect to have the factory in operation the latter part of March, 1902. The company now have their full equipment of machinery, tools, &c. They also have in place, ready to connect, the boilers, engines and generators. They expect to operate their plant wholly by electricity and have installed two units of 450 horse-power each. The capacity of the steam plant is 600 horse-power. The only work now remaining to complete the plant and have it ready for operation is the steam fitting, which is going on rapidly. The warehouse is 64 x 196 feet, four stories high, and is of slow burning or mill construction, equipped with automatic sprinklers. The stamping department is a one-story fire proof building, 140 x 260 feet. The enameling department is a one-story fire proof building, 260 x 285 feet. The power plant is inclosed by a fire proof building, all of these fire proof buildings being of brick, steel and tile construction. There are three switches connecting with the various departments of the business. The switches connect directly with the Big Four, Chicago & Eastern Illinois and the Vandalia-Pennsylvania lines.

The Bates-Hawley Signal Mail Box.

The Signal Mail Box Company, Joliet, Ill., have just placed on the market the mail box herewith illustrated, which is designed for either rural or city delivery. Fig. 1 is a representation of the box and Fig. 2 is a



Fig. 1.—The Bates-Hawley Signal Mail Box.

sectional view, showing the manner in which the signal flag is operated. This box is of full Government size, 18 x 6½ x 11½ inches. It is made of heavy galvanized metal throughout, completely weather and rust proof. It is arranged to attach to the company's Everlasting steel post, or to an ordinary wooden post, as desired. The company state that both box and post conform to all post office requirements and have the full indorsement of the Postmaster-General. The box is handsomely decorated with aluminum bronze and red, and is sufficiently attractive in appearance to harmonize with

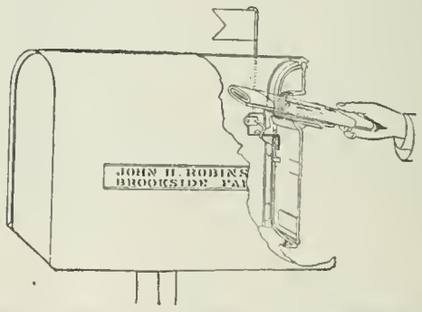


Fig. 2.—Sectional View of Signal Mail Box.

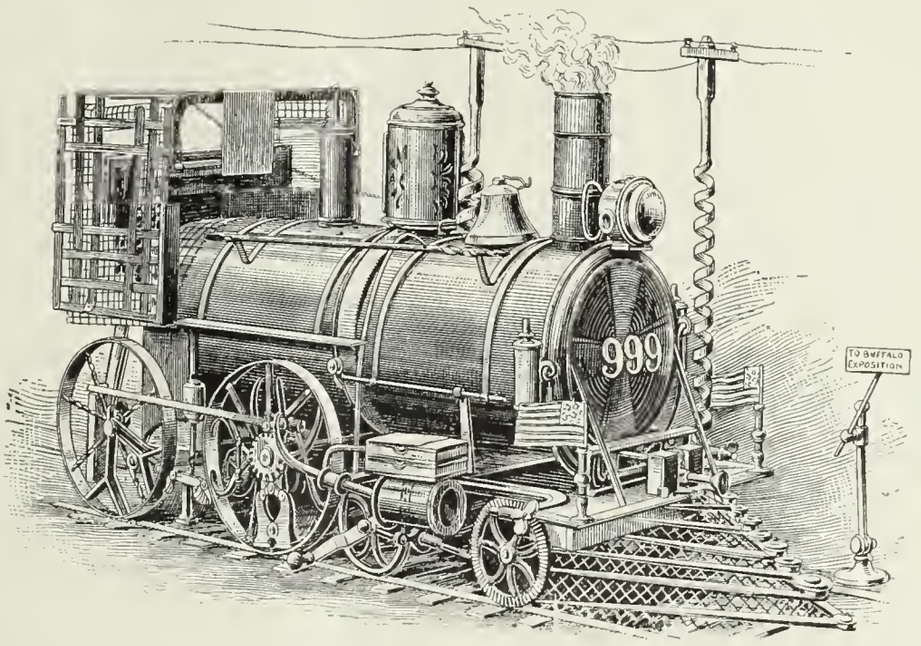
the finest surroundings. The signal flag on this box is raised automatically when a letter is deposited and is automatically dropped when the door is opened for removing mail, making it unnecessary to examine the box closely to ascertain whether it contains mail or not. This is a great convenience to both the owner and the carrier. The locks are of the best master keyed grade, no two alike, each lock being provided with two keys for the owner's use. A master key which will unlock all boxes is provided for the carrier, so that he can collect mail, which gives the owner absolute security. The lock is so arranged that whenever desired the owner can keep the box unlocked. The owner's name is stamped in an attractive celluloid plate, which can easily be changed. An iron bracket and bolts for fastening are furnished with each box.

A Hardware Locomotive.

A locomotive 42 inches long and 20 inches high stands in the show window of A. W. Gerstner, 632 to 634 Eighth avenue, New York. It is constructed entirely out of articles taken from their stock by Sidney Stansbury, one of the clerks, who claims it contains some radical improvements over the famous Empire State engine, No. 999, after which it was modeled.

The several parts of the locomotive were made up as described below:

Boiler, two plumbers' Furnaces.
Head of Boiler, one Ventilator.
Front Truck, four Hand Drills.
Platform for Truck, two Squares and six Scale Rules.
Cylinders, two piano makers' Glue Pots.
Steam Chest, four Pocket Levels, four Scrapers.
Steam Pipe, two Blow Pipes.
Cow Catcher, six Calipers.
Draw Head, Dowel Pointer and Wire Cutter.
Front Rod to Boiler, two legs for Starrett's Dividers.
Piston Rod, two legs for Starrett's Dividers.
Frames and Guides for Piston Rod, two Hack Saw Frames.
Westinghouse Air Brakes, two Chucks.
Shoe for same, two Thread Gauges.
Connecting Rod for Driving Wheels, two Saw Blades.



A Hardware Locomotive.

Cab, Hack Saw Frames and Blades.
Smoke Stack, one plumbers' Grease Cup.
Head Light, one Pocket Lantern.
Bell, one Hand Bell.
Sand Box, one Brazing Lamp.
Sand Box Tube, two Blow Pipes.
Whistle, one Brazing Lamp.
Hand Rails on Boiler, two bell hangers' Bits.
Walk along Boiler, two Steel Rules and two Brass Rules.
Smoke, Russia Hemp Rope.
Telegraph Poles, three Ship Augers.
Railroad sign, one Surface Gauge.
Side Lights, two Alcohol Torches.
Eccentric Rods, two Blow Pipes.
Fire Box, two Combination Squares with center heads.

The four driving wheels are 8 inches in diameter, each being brass bound. The hubs of each are made of Wire Gauges. The spokes of the first is composed of a pair of Starrett's Cutting Nippers, two Thread Calipers and Center Punch; the second of two Center Heads, two Scale Rules, four Twist Drills and two Flat Metal Drills; the third of four Pin Vises and four Screw Driver Bits, and the fourth of one pair of Hall's Cutting Nippers, one pair End Cutting Nippers and five Taps. Electric Wire Couplings were used for the driving rod pins. The track is made of Saw Webs and the ties of 2-Foot Rules.

Morton Hardware Company, Birmingham, Ala., have been organized with a capital of $5000. Their line comprises Hardware, Shelf and Heavy, Stoves and Tinware, Agricultural Implements, Sporting and Athletic Goods, &c.

The Show Window.

The show window display, like the newspaper advertisement, should be changed frequently. A long standing display will bring in business but little better than a long standing newspaper advertisement. Like the newspaper advertisement, the show window should be in charge of one person who will give it careful attention. Many retail dealers in stoves, tinware, hardware and house furnishing lines neglect their windows and do not get as large returns from them as is possible, but there is evidence of a stronger tendency among the trade to avail themselves of this cheap and effective means of advertising.

Stove and Hardware Dealers.

H. M. Bailey has lately opened up in the wholesale and retail business in Sheffield, Ala. His stock comprises Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, Paints, Brushes, Cement, China, Glassware, &c. Mr. Bailey has a new store, which has been specially fitted up for the business.

J. F. Van Deren has sold a half interest in the Van Deren Hardware Company, Lexington, Ky., to W. M. Van Deren. The style will continue unchanged. The concern are wholesalers and retailers of Shelf and Heavy Hardware, Stoves, Tinware, Sporting Goods, &c. They are putting two more traveling salesmen on the road.

W. R. Ostrander & Co., 22 Dey street, New York, have just issued the thirteenth edition of their illustrated trade catalogue, containing 296 pages. In it are shown large assortments of Speaking Tube Hardware, Electric Bells and Batteries, Electric Lighting Material, Telephone and Telegraph Instruments, and general lines of Electrical Supplies, of which they are large manufacturers. They also deal largely in Bell Hangers' Hardware and Electricians' Tools.

Ford Hardware Company, wholesale and retail dealers in Hardware, Farm Implements, Stoves, Buggies, Blacksmiths' Supplies, &c., Washington C. H., Ohio, advise us that there has been no change in their style since they began business two years ago. From time to time they receive from manufacturers and jobbers communications addressing them under other styles, which they fail to understand, as the business has been conducted under the same name from the first.

Hoy & Schroeder, dealers in Heavy and Shelf Hardware, Stoves, Furnaces, Tinware, Sporting Goods,

Plumbing Goods, &c., Postville, Iowa, have been succeeded by Schroeder & Stone, Mr. Schroeder having taken into partnership with him E. S. Stone.

J. T. Whitfield has sold his Hardware, Stove and Sporting Goods business in Warrensburg, Mo., to Ben T. Sams.

G. H. Griswold is successor to Holton & Lawyer in the Hardware, Stove and Agricultural Implement business in Tennessee, Ill.

W. H. Millspaugh has moved his Hardware and Stove business from 23 and 25 Phelps street, Oneida, N. Y., to 45 Main street, where he will also conduct a first-class tin and jobbing shop. Mr. Millspaugh is also interested in the Bicycle and Fishing Tackle business of W. H. Robinson & Co., in the same town.

G. R. Dill has disposed of his Hardware, Stove and furniture business in Belvidere, Neb., to Sigel Matson, who will continue at the old stand.

E. B. Mundy has lately opened a Hardware store in Avoca, O. T., handling also Stoves and Tinware, Agricultural Implements, Sporting Goods, &c.

Daniel Wood has sold a half interest in his Hardware, Stove and Agricultural Implement business in Hillsboro, Iowa, to R. E. Watts, and the style has become Wood & Watts.

A. T. Swanson has just moved his stock of Hardware, Stoves, &c., from Marysville to Pony, Mont., where he occupies a new store building. Mr. Swanson carries a full line of Hardware, Stoves, Glass, House Furnishing Goods, and also conducts a tin shop.

The Iron Clad Mfg. Company, New York City, are reported to have obtained a considerable contract for Galvanized Water Buckets for use in the military barracks in Northern India. They expect to ship some 500 of these Buckets to India monthly for some time to come.

The City Forge & Iron Works, Dayton, Ohio, have sent us a number of circulars which they are distributing in the interests of the Steel Tubular Trucks, Gem Box Trucks, S. & S. Patent Stove Pipe Thimble and the Gem Bicycle Stand, which they are manufacturing.

W. J. O'Neil, 20 Crown street, New Haven, Conn., dealer in Furnaces, has just laid in a stock of Gas and Oil Stoves, which he offers for sale at reasonable prices.

McRae & Son, St. Johnsville, N. Y., announce that they have purchased the stock and good will of James McLean in the Stove and House Furnishing Goods business, at 112 North James street, Rome, N. Y. The firm will put in a complete line of Sterling Ranges and other goods and run it as a branch of their St. Johnsville store.

The Stove store of Riggs & Berrell, at 5 East Fourth street, Wilmington, Del., was recently damaged by fire to the extent of $1000.

R. I. Kingman, for many years confidential clerk for R. L. Rossman, 557 Warren street, Hudson, N. Y., and after Mr. Rossman's death manager for the estate, has purchased his Stove and Hardware business, and will continue to conduct it at the old established stand. Mr. Kingman takes possession April 1.

The Anshutz Mfg. Company of Frankford, Ind., have been incorporated with a capital of $10,000 to manufacture a newly invented Dust Pan.

S. B. Emery & Co. have added a Stove and Tinware department to their store at Sanford, Maine.

E. M. Best has opened a Stove and Tinware store at Peterborough, Ont., Canada.

The reduction of $41,000,000 in the exports of the United States for the eight months ending with February, 1902, is not considered at all discouraging by those interested in the growth of our export trade, nor is it an indication of a decline in the general growth of that trade. On the contrary, in all important articles except three in which conditions are abnormal, there has been an increase. The decrease is solely or practically so in corn, due to the great crop shortage caused by the drought of last summer; in copper, in which prices have fallen materially, and in iron and steel manufactures, due to the unusual demand of the home market upon our manufacturers and the reduced demand in foreign markets. In these three items, in each of which the falling off in exports is due to exceptional causes and may be considered as temporary, the reduction is over $70,000,000, while the total reduction in exports for the eight months ending with February is but $41,000,000, showing that in other articles than those in which conditions are abnormal there has been an increase in exports of more than $30,000,000. Even with this decrease of $41,000,000, the United States still stands at the head of the world's exporting nations, the total exports of domestic merchandise being: United States, $957,986,427, and the United Kingdom, which most nearly approaches the figures of the United States, $911,346,250.

The American Exhibition in London.

Preparations for the opening of the American exhibition, to be held at the Crystal Palace, London, from May to October of this year, are said to be progressing very favorably. The exhibition is designed to demonstrate the immense commercial and industrial development that has taken place in the United States during recent years, and it promises to be the largest and most important exhibition of purely American products, arts, industries and inventions ever made abroad. The natural advantages of the Crystal Palace for the accommodation of such an exhibition are well known. The buildings cover 16 acres, and are all perfectly lighted, heated and ventilated. They are surrounded by some of the most beautiful ornamental grounds in Europe, extending over 200 acres. The Crystal Palace is within easy reach of all parts of London.

The fact that the exhibition will be held at a time when crowds of visitors from all parts of the world will be in London to witness the coronation of King Edward VII. makes the time of the exhibition peculiarly auspicious, especially as quite a number of celebrations connected with the coronation festivities will be held in the grounds of the Crystal Palace. In connection with the exhibition a commercial bureau is to be established, where all necessary information will be supplied to exhibitors as to channels of trade and the placing of goods upon the British and Continental markets. The bureau will be under the direction of a committee of representative American and British firms. Special juries will be selected to judge the merits of exhibits, and medals and diplomas will be awarded.

The classification of exhibits includes the following:

Class 1.—Machinery and Mechanical Industry:

A.—Mining, agricultural, printing, electrical, traction, &c.

B.—Shipbuilding, locomotives, railway and engineering equipment.

C.—Automobiles, bicycles, typewriters, sewing machines, laundry, domestic and labor saving appliances, &c.

D.—Hardware, tools and cutlery.

Class 2.—Natural and Agricultural Products, Including Cotton, Timber, Mineral Ores, &c.

Class 6.—Hygiene, Lighting, Heating, Ventilating and Sanitary Appliances.

The commissioner for the United States is Alfred H. Post, Produce Exchange, New York, from whom all information regarding the exhibition, together with plans of the floor space for exhibits, &c., may be procured.

Hjalmar Lange, a Danish inventor, has taken out a patent in Denmark for a process of soldering aluminum which consists of first coating the aluminum surfaces to be soldered with a layer of zinc. On top of the zinc is melted a layer of an alloy of one part aluminum to two and one-half parts of zinc. The surfaces are placed together and heated until the alloy between them is liquefied.

On March 17 a decree was issued by the Spanish Government establishing an eight-hour day for all working people on the State domains and in the State mines, workshops, &c., and providing that each hour of overtime is to be paid for at the rate of one-eighth of the daily wage.

APPORTIONING RADIATION.

BY B. R.

Having successfully proven the following basis for determining the amount of radiation required for a building in my own practice, I have recommended it to others who have also demonstrated its usefulness. So I now present it to the readers of *The Metal Worker* for such use as they may wish to make of it. A man of experience will apply these rules with some judgment, and common sense is an important factor that can be brought into use by any one. As will be seen by a little study the method of proceeding includes consideration of five factors or formulas and the results to be subject to given multipliers adopted for different kinds of steam and hot water plants:

1. Width of room by length of room by hight of room equals cubic feet of air in room.

2. Cubic feet of air in room divided by 75 equals equivalent of glass cooling effect of room.

3. Find actual square feet of glass in room, measuring between casings.

4. Reduce the square feet of exposed wall in room to equivalent of glass cooling effect by dividing by 10 if wall is 8 to 13 inches thick, by 15 if wall is 13 to 25 inches thick, and by 20 if wall is 25 to 33 inches thick. This is for walls only having an air space.

5. The glass equivalent derived from cubic feet of air in room in square feet (Formula 2) plus the actual glass, in square feet, in room (Formula 3), plus the glass equivalent derived from exposed wall in square feet (Formula 4), and this total multiplied by—

FOR HOT WATER HEATING.

0.80 equals direct radiation; outside temperature, 0 degrees; inside temperature, 70 degrees; water, 180 degrees.

1.20 equals indirect radiation; outside temperature, 0 degrees; inside temperature, 70 degrees; water, 180 degrees.

1.05 equals direct-indirect radiation; outside temperature, 0 degrees; inside temperature, 70 degrees; water, 180 degrees.

FOR STEAM HEATING

0.48 equals direct radiation; outside temperature, 0 degrees; inside temperature, 70 degrees; steam, 219 degrees (2 pounds).

0.72 equals indirect radiation; outside temperature, 0 degrees; inside temperature, 70 degrees; steam, 219 degrees (2 pounds).

0.64 equals direct-indirect radiation; outside temperature, 0 degrees; inside temperature, 70 degrees; steam, 219 degrees (2 pounds).

ILLUSTRATION: Room 10 × 20 × 10 = 2000 cubic feet of air in room. 2000 ÷ 75 = 26.6 (approximately 27) = equivalent of glass in cooling effect.

3 windows, 3′ × 5′, = 45 square feet of glass; 30 lineal feet of wall multiplied by hight, 10 feet, = 300 square feet, less glass, = 255 actual square feet of wall ÷ 10, if 8″ to 13″ wall, = 25.5 (approximately 26) = equivalent of glass in cooling effect.

27 (equivalent of glass from air in room) + 45 (actual glass in room) + 26 (equivalent of glass in exposed wall) = 98.

Multiply 98 by 0.80 = 78.4 square feet of water radiation required to heat room to 70° when outside is 0°, with water at 180°.

Multiply 98 by 0.48 = 47.04 square feet of steam radiation required to heat room to 70° when outside is 0°.

James B. Clow & Sons' New Building.

James B. Clow & Sons, who for many years have been located at Lake and Franklin streets, Chicago, are transferring their stock to their new building, at Franklin and Harrison streets. This structure is one of the most substantial and best equipped of the many fine buildings recently erected in Chicago. It will be used for office, warehouse and manufacturing purposes. The Clow office force is nearly settled in the new quarters and machinery is now being purchased for the enlargement of the brass foundries and the finishing and cabinet works of the sanitary manufacturing departments, which will soon be located on the upper floors. Heaters will be manufactured in the basement, where the pipe cutting and radiator assembling shops will be located, the radiators being manufactured at the Clow pipe foundries, at Newcomerstown, Ohio. The assembling of plumbing fixtures will be done on the fifth floor and the offices and showrooms will be located on the second floor, while the remaining floors will be largely used for stock. This building, which was designed by Holabird & Roche of Chicago, has the famous saw-tooth roof, affording all northern light for the seventh floor foundries and shops. W. A. & A. E. Wells of Chicago are the contractors. Every labor saving device applicable to this line of business is being introduced both in the sales and manufacturing departments. The shipping facilities of the new location are also ideal, with prominent thoroughfares on two sides of the building, the river on a third side and a special track, running into the basement, connecting directly with all the main lines of the South, Southeast and Southwest.

The Sanitary Earthen Ware Trade.

The Sanitary Potters' Association, in making the new prices which went into effect on March 1, did so with a full knowledge of the conditions which previously prevailed in the trade, and with a set purpose of eliminating the objectionable features of those conditions. The new rules of sale adopted by the association, which also took effect on the first of the month, make the purchaser a party to the maintenance of the price named by the manufacturers. The jobber is put upon a rebate basis which will be given him by the association, and in order to get the rebate he is compelled to make affidavit that he does not buy his wares at a price better than that named by the association. If he does get a better price, he is compelled by the terms of his agreement to divulge the price at which he is buying, so that all manufacturers can make prices equal to those quoted.

This agreement will probably be effective for a certain length of time, but it hardly seems to contain the element of permanence. It has always been found that where prices are equal the bulk of the business with the jobbing trade goes to the plants that are making the best goods. The concerns that are making goods which are not up to the highest standard are consequently compelled, in order to sell their material, to quote a materially lower price than that agreed upon. It is this consideration that would appear to threaten the permanent endurance of the Sanitary Potters' Association. The pooling of the interests of the different plants will naturally tend to prolong the life of the organization and keep the small and newer concerns in line. It does not take much over a year, however, to demonstrate to the manufacturer of poor goods that he will have to go to greater expense in producing his wares in order to market them, or else put his prices below those agreed upon by the association. Of course, a great many buyers will for business and sentimental reasons continue to give their trade to the smaller plants. They will not care to change the designs and styles on which they have built up a trade, but it will ultimately be found that where a customer is aware that he can get a better grade of goods at the same price that he has been paying for the inferior ware he is likely to change his jobbing house. The present agreement among the manufacturers of sanitary ware will run for one year from March 1, and until the expiration of that time there is likely to be little or no change in prices.

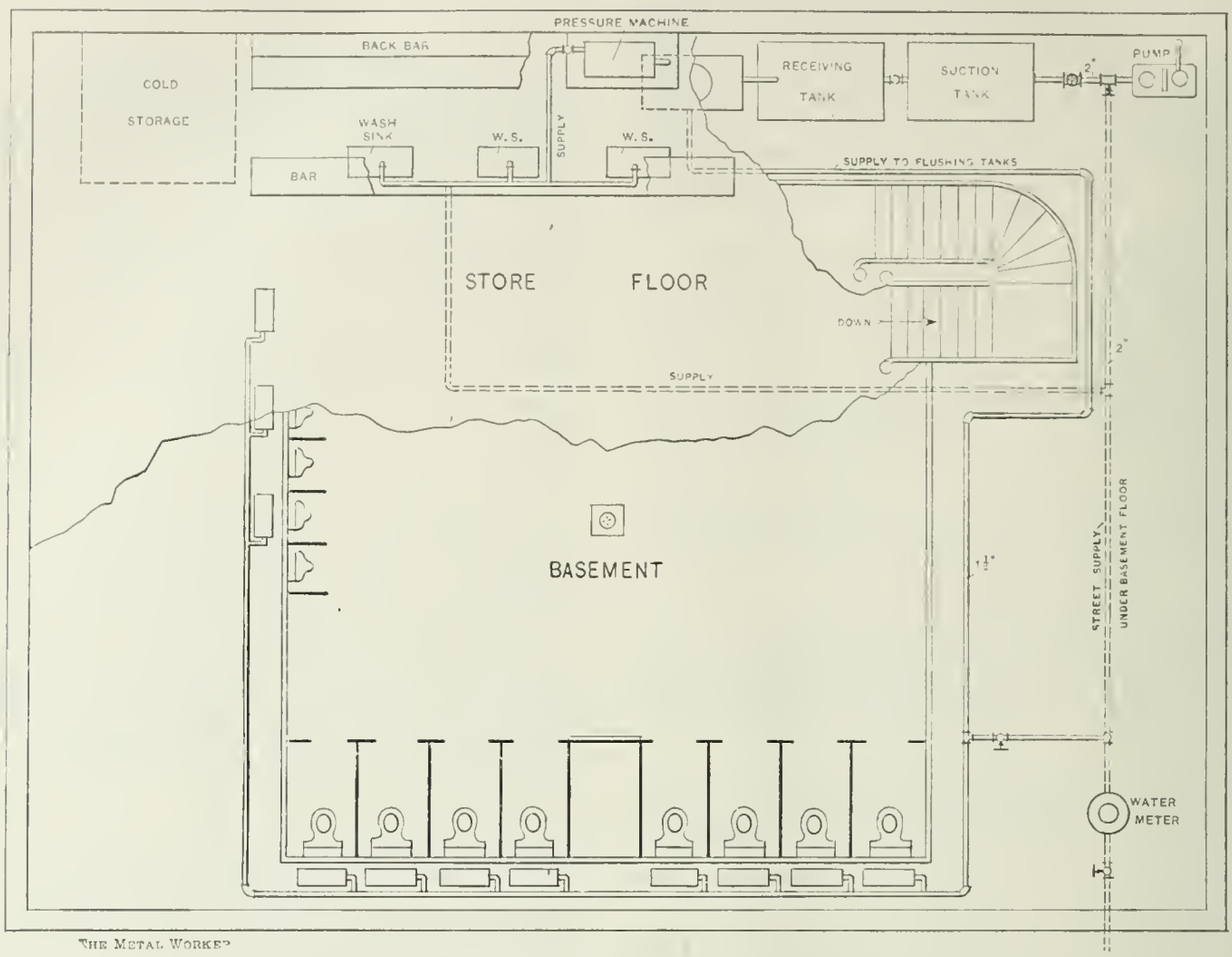
Acetylene in the Laboratory.

An interesting paper, says the London *Ironmonger*, has been published lately by C. H. Higgins, on the use of acetylene in bacteriological laboratories, which are often erected, temporarily or otherwise, in localities where coal gas is not available. Chemists of former generations had to conduct their operations which required heat with methylated spirit or coke; but the chemists of the present day have forgotten or have never seen the wonderful furnaces of bygone times, and without coal gas are almost as helpless as without a laboratory at all. Mr. Higgins was called on to conduct bacteriological experiments on bubonic plague in some wild part of British Columbia, and, needing something to heat his various apparatus, selected acetylene. He arranged to have a double set of gas pipes throughout the laboratory. One set, connected with the gas holder, delivered acetylene at a pressure of 4 inches to serve the Bunsen burners and the boiling stoves; the other set of pipes supplied through a governor to reduce the pressure to 2 inches, which best suited the jets employed to illuminate the building. One of the latter was used for microscopic work, and seems to have entire satisfied Mr. Higgins. A ¼-inch pipe was found to be large enough to supply 18 ordinary Bunsens.

REDUCING WATER EXPENSE AND WASTE.

BY D. F. N.

In a recent article in *The Metal Worker* I noted how the officials in the city mentioned disposed of extravagant water consumers. This recalls a demand for my services to reduce the expense for water that had been experienced by the owner of a modern hotel in New York City. Having received from the city a bill for $360 for water service, he desired to curtail his expenses by utilizing some of the water that had hitherto gone to waste. Some idea of the number and character of the fixtures in the hotel may be gained from Fig. 1, which is a plan of one of the floors. Fig. 2 is an elevation showing the means resorted to for reducing the water bill.



Reducing Water Expense and Waste.—Fig. 1.—Plan Showing Fixtures Supplied.

The principal cause of the expense was a machine placed over a sink behind the front bar, for maintaining pressure in the barrels in the cold storage room in the basement. This machine was operated by means of water power derived from the city water supply. The large water bill was the result of allowing the water which had passed through the machine to run to waste through the sink and then to the sewer, an almost continuous flow being maintained. On examining the fixtures and piping with a view to affording relief, I noticed a ½-inch supply pipe from the street main connected with the pressure machine, and a ¾-inch discharge pipe from it to the sink. Every time the machine operated a discharge would take place, with a considerable loss of water. The water which once went to loss is now utilized in the following manner:

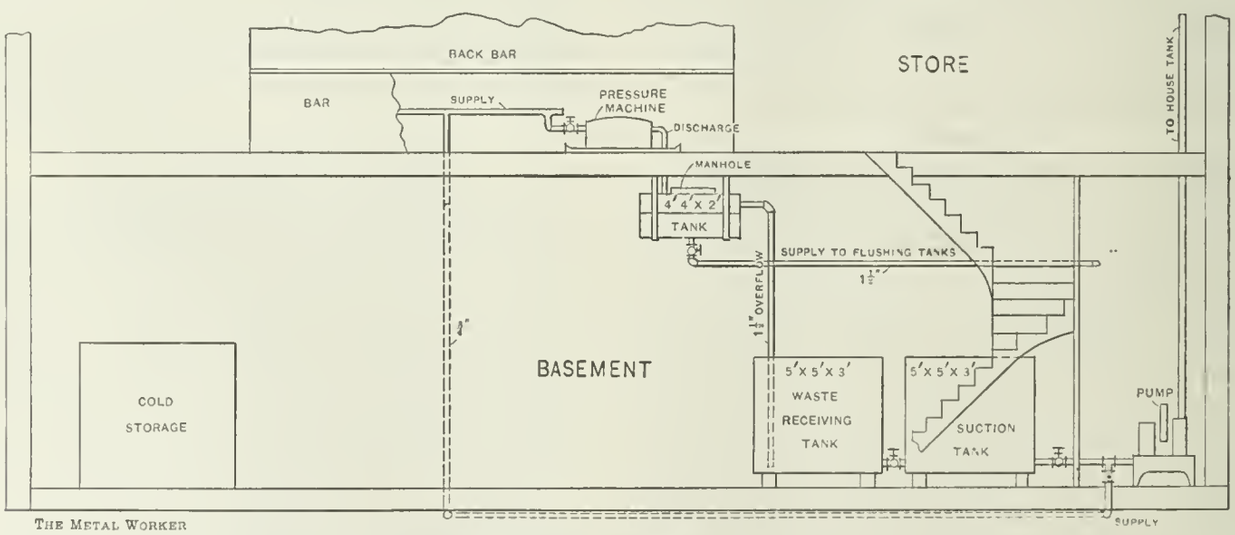


Fig. 2.—Apparatus for Utilizing the Waste Water.

Two tanks 5 feet square and 3 feet deep were made and lined with tinned copper, each being of 2-inch planking, well bolted together. These were placed in the north passageway adjoining the large toilet room shown in Fig. 1. On the floor beams of this passageway a smaller tank, 4 feet square and 2 feet deep, was

supported by means of heavy iron straps. Above this small tank the pressure machine was located, the floor under the machine being covered with sheet lead with beveled strips 6 inches high around the edge, so that any overflow might be prevented from doing damage, and also to catch the discharge from the machine. From this lead safe a ¾-inch pipe was carried down to the tank on the ceiling, shown in Fig. 2. From the bottom of this tank a 1½-inch galvanized iron pipe was carried around, as shown in Fig. 1, to supply the flushing tanks to the water closet and urinals in the toilet room below. When the water was not all used in the toilet room it overflowed into the larger tanks on the lower floor.

One of these tanks was arranged to serve as a suction tank to a Rider pumping engine. This pumping engine also was connected with the street main, in order to secure a supply in case the tanks did not furnish all the water required. The water from these waste tanks was pumped to a large tank in the upper part of the building, which supplied the different toilet rooms and bathrooms on the upper floors. As the Rider engine had to be operated to force water to the house tank, it is utilized now for saving water that had in the past been wasted, and as there has seldom been necessity for pumping the water from the street mains it is anticipated that a substantial reduction will be effected in the water bill.

HIGH PRESSURE GAS LIGHTING IN ENGLAND.

The recent volcanic eruption in the Welsbach affairs of this country, says our London correspondent, has stimulated interest in various quarters relating to gas engineering. Joseph Nasmith, in a paper on "Intensified Gas Lighting," read before the Manchester Association of Engineers, referred to the fears which years ago pervaded many minds that the introduction of electricity would end forever the era of gas illumination. His opinion, however, was that gas was far from being a defunct lighting medium, and that, as a matter of fact, it was in greater demand than ever, not only for lighting but for heating. After referring to the merit of the Welsbach patents he expressed the opinion that the improvement made by the Welsbach was by no means at an end. He thinks that in a few years we shall have better and cheaper mantles in public use.

Another stage in the development of gas, in his opinion, was the introduction of high pressure, or intensified, gas lighting. The present Bunsen type, used in incandescent gas lighting, was liable to different results, according to the pressure of the gas in different localities. The pressure was generally not much over 1 inch water gauge. It was obvious that at this pressure the velocity of the gas jet and the consequent induced current of air would be comparatively slow. The new method consisted in compressing the gas under a pressure of about 8 inches of water—1-3 pound—and so increasing its velocity at the jet, thereby inducing a greater volume of air to mix with it in the body of the burner. Of course, this pressure was only high in a comparative sense, but it was the first step on a path which may lead us very far.

In considering this last development no pretense was made of doing more than collating the particulars already well known, and it was only because the new method provided an improved method of illumination, which was at once cheap and effective that the attention of the members was directed toward it. It is already making great headway for internal illumination, and especially for workshops, and on that account formed a subject of interest to all engaged in industry.

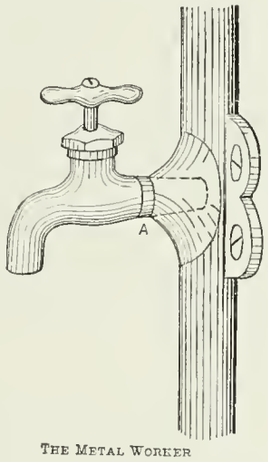
In considering the question of illumination it must be remembered that mere brilliance was not the highest property, except it was desired to deliver a flash of light to a specific point, as in the heliograph. Diffusion, or perhaps more correctly suffusion, was more important. The light from an electric arc lamp was brilliant, but it was coldly penetrating and diffused itself to a very slight extent. It was this property which caused it to cast so great a shadow. The air was not filled with light as it should be, and outside the direct range of the rays there was no communication of light. How different was the light of the incandescent mantle. Within its range of illumination it seemed to suffuse the air with light and make all the space within that range luminous. Widen its range and you increased its usefulness. It produced no violent shadows like the arc light, but distributed the light with remarkable uniformity. It was the object of the system of intensified gas lighting to widen the range of the ordinary incandescent mantle and thus increase its illuminating value.

Mr. Nasmith, at the end of his lecture, pleaded for a reduction of the standard from 16 to 14 candles. Such a reduction, in his opinion, would be a benefit to all concerned. Compression, or high pressure, was a step in the right direction, and with modern aids would enable a cheaper gas to be effectually employed. At the end of this lecture there was an interesting discussion, in which all agreed that the modern forms of gas lighting were cheaper and more efficient than the electric light. One speaker expressed the opinion that unless a stronger form of mantle were forthcoming the incandescent system would not endure. The lecturer observed, however, that when the Welsbach patent rights expired several improved mantles would be available.

FOR THE SKILLFUL PLUMBER.

BY D. F. N.

A neat little trick that has been accomplished a few times by skillful plumbers is the removal of a sink or shower faucet from a lead pipe without disturbing the



THE METAL WORKER

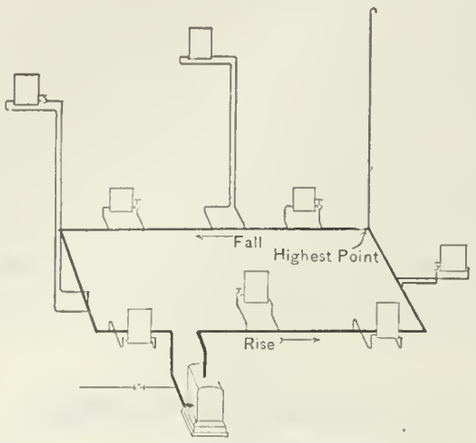
For the Skillful Plumber.

wood work back of the fixture. To remove the cock without disturbing the wood work, tacks or anything is quite a feat. To do it the plumber must heat the old cock so hot that it will release itself from the solder by a twist with the hand, when it can be drawn out. The new cock must be already tinned and quite hot, ready to take the place of the old one. The tinning of the new cock should extend at least ¼ inch further than usual. Then, when everything is ready and the required heat is reached in the old cock, pull it out and quickly insert the new one. After the cock and the solder cool in the old branch, place paper around the old branch and wipe fresh solder around the extra ¼-inch space that has been tinned on the new cock and left outside of the branch, as shown at A in the sketch. This will make a neat, clean ring of bright new solder tapering back from the cock to the edge of the old branch. In a great many cases the sink has to be taken down, a couple of feet of pipe used, with extra solder, tacks and screws, and possibly with some damage to the wood work. All of this can be avoided, however, by a quick and skillful workman.

FRANK POWERS of Lunenburg, vice-president of the National Association of Master Plumbers of Canada, and president of the Nova Scotia Association, has been visiting Halifax, where the next convention of the National Association will be held, opening Tuesday, July 1. Mr. Powers has been making provision for the convention and the delegates.

A One-Pipe Hot Water Heating Apparatus.

With the older two-pipe system of obtaining hot water circulation, says the London *Ironmonger*, the principle involved is that of taking hot water to radiators (or coils and sets of pipe) and, on the water leaving each radiator, letting it enter a return main which conducts it back to the boiler to be reheated. In other words, the water in any one radiator does not pass to a second or any other radiator until it has been back to the boiler to



A One-Pipe Hot Water Heating Apparatus.—Fig. 1.—A General View of the System.

be reheated. With the one-pipe system of work the reverse of this applies. The water served to a radiator passes back into the same main, and goes on to do further work.

The one-pipe method of work is a favorite one with many engineers, and it certainly acts positively and well. It is practically impossible for any radiator to escape being heated. Short circuit, so easily obtained with two-pipe work, is hardly possible with one-pipe circulations.

Fig. 1 gives in perspective outline a simple one-pipe apparatus, consisting of a single main circuit only. In large works there may be two, three or more circuits, in which case it is desirable to run each circuit independently. All the flows and returns should have distinct connections at the boiler. If a main must be branched, it should be only the flow pipe, never the return. An apparatus in which one flow pipe leaves the boiler, and, say, three returns come back to it, will work well if the pipes are proportioned with ordinary care; but to branch a single flow and join the ends of the branches into one return is to court failure. Fig. 2 (plan) will serve to illustrate this, and it has the advantage of representing actual practice. The central pipe was the branch, and was a smaller sized pipe than the main circuit. The water in it remained as still as if the tube had been plugged.

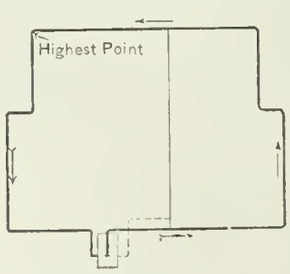


Fig. 2.—Showing Remedy to a Faulty System.

The main circuit worked freely and well, and this branch got hot for about 2 feet at each end. Apparently the water in it was stationary, although some of the heated water circulating past the tees worked into it, as it might have done if the pipe had a closed stop valve in it. The alteration made was to disconnect the end on the flow near the boiler and take it into the boiler as a return, as shown by dotted line. The circulation then ran through a flow pipe out from the boiler and returned through two returns—one main and one branch. The apparatus worked perfectly after the alteration, without any perceptible difference in temperature in the main and branch. It will be understood that the pipes shown had radiators connected here and there upon them, but they have been omitted here in order to make the arrangement of the line of pipe clear.

Another difference between the two-pipe and the one-pipe systems is that while with the former the pipes may be gradually reduced in size as they get away from the boiler and past the work, with one-pipe circuits no reduction is possible unless the circuit is branched; then two branches together need be of no greater area than the one pipe from which they take their supply.

The one-pipe system is of particular advantage when the work is scattered. As a typical case, under good conditions for the system, we might instance a large building of one or two floors—say, a bank or a large shop. The main circuit is carried around the basement, passing all the scattered points where the radiators are, as Fig. 1 will serve to show. Sometimes the area to be heated is too large for radiators fixed round the outer walls only, and central ones are needed. Fig. 3 shows a favorite scheme of piping in such a case, a flow going out up the center of the building or thereabouts to take the radiators there, and branching into two returns to take those around the outer walls. The single flow would have an area equal to the two returns, but no other variation in the sizes of the mains is permissible.

The radiator connections are out and in the one pipe, as shown in Fig. 4, and the movement of the water is indicated by the arrows. Some fitters make a practice of connecting both pipes to tees in the mains with the

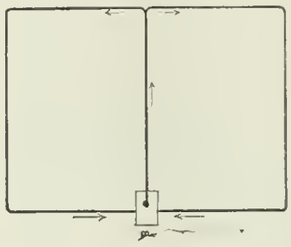


Fig. 3.—A Double Circuit.

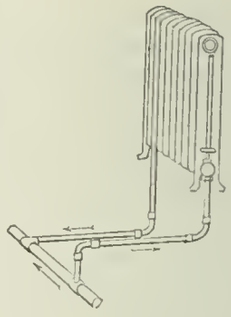


Fig. 4.—The Radiator Connections.

branch turned upward, but a more correct method is to have the branch on the flow tee up, and that on the return horizontal, as sketch in Fig. 4. Water, when it has passed through a radiator, is cooler than the water in the main, and although fit for some further service, it is undesirable to bring it back onto the top of the hottest water in the main. The water in the main pipe becomes divided into a top stratum of hot water and a somewhat cooler lower stratum when it has passed through two or three radiators, and by bringing the return water in horizontally, as shown, it affords the best opportunity for the hottest water to pass along the top of the pipe to the more distant radiators. In other words, it is not a good plan to mix the water from the first radiators with the hotter water which is passing to the further ones.

In the one-pipe system of hot water work greater care is necessary in adjusting radiator valves than with a two-pipe apparatus. When the number of radiators on a circuit of, say, 2½-inch pipe exceeds about six, then there is a very noticeable difference in the temperature of the first and of the sixth one if the valves are not regulated. The remedy then is to regulate the valves—advice easily given, but somewhat hard to follow. The fitter may regulate them and get excellent results, but so soon as he has gone, perhaps within a few hours, a servant or other ignorant person meddles with them and the regulation is undone. For this work a valve such as is so largely used on the Continent for steam work is suitable. It is a double valve, one portion, a full way plug valve, being "set" by the fitter, then capped over or made immovable, while the other portion or valve is of the ordinary regulating kind.

It is a good plan to limit the work on a circuit, so as not to put on too great a number of radiators. If instead of one 4-inch circuit it is possible to run two 3-inch circuits, or any smaller pipes equivalent to a 4-

inch, quicker results will be obtained on the last radiators, and they will probably be maintained at a better temperature. Several small circuits are better than one large one, but the latter is quite practicable when the small ones are not possible.

PROPOSED VENTILATION AND SANITATION LAW FOR NEW YORK STATE.

Those who have prepared and are endeavoring to secure the enactment by the Legislature of New York State of the following bill ask the co-operation and assistance of the heating and plumbing trade in the work. The measure, which is considered a worthy one, has failed of enactment heretofore only through the rush at the end of the legislative session. Correspondence and conversation with representatives and Senators urging early action will be likely to have a beneficial effect:

AN ACT TO PROVIDE FOR PROPER SANITATION, VENTILATION AND PROTECTION FROM FIRE OF SCHOOL HOUSES AND OTHER PUBLIC BUILDINGS.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Every school house and other public building hereafter erected in a city or incorporated village within this State shall be provided with a reasonably sufficient number of proper water closets, lavatories, earth closets or privies for the use of persons occupying or admitted to such school houses or public building; shall be kept clean and free from all noxious smells or gases arising from any closet, drain, privy or other nuisance, and shall be provided with proper means for ventilation in such manner that there shall be at all times a sufficient supply of pure air therein.

Sec. 2. Prior to the erection or construction of any school house or public building the person or persons or corporation owning the same shall submit a full and complete copy of the plans, together with a statement in writing of the proposed building, which statement must contain a clear and comprehensive description, properly sworn to by said owner or authorized representative, of those portions of the proposed work which deal with the sanitation, ventilation and protection from fire of said proposed buildings.

Such details, statement and copy of the plans shall be submitted to and filed with the Department of Buildings, Health Board or other officer or officers having like jurisdiction within an incorporated city or village where said buildings are about to be erected, and in all other places, including any city or incorporated village not having an officer or officers exercising jurisdiction as a board of health or health officer, such detail statement and copy of plans shall be submitted to and filed with the State Board of Health.

No such school house or other public building shall be erected or constructed until such specifications and plans shall have been approved in writing by the Department of Buildings, Board of Health or officer exercising jurisdiction thereof, to whom such plans shall be submitted as required by this act.

The sanitation, ventilation and protection from fire of every such school house or other public building, as provided by this act, shall be subject to the inspection of such Board of Health or other officer exercising like jurisdiction during the progress of such erection or construction, by its or his agents or servants, and shall conform in all things to the reasonable requirements of such Board of Health or other officer of like jurisdiction.

Sec. 3. Every such school house and public building for which a detailed statement and plans are filed, as provided by this act, shall be ventilated in such a manner that the quantity of foul or vitiated air exhausted or removed shall be positive and independent of atmospheric changes, and shall not be less than 15 cubic feet per minute for each person; and the quantity of fresh air admitted shall not be less than 15 cubic feet per minute for each person that such school room and public building can accommodate.

Sec. 4. It is further made the duty of such Department of Buildings, Board of Health, health officer or other body or person having jurisdiction to have such inspections made from time to time as may be deemed necessary, to see that the said school houses and public buildings as are built in compliance with this act are kept and maintained in a proper sanitary condition, and that the provisions of this act are complied with.

Should said inspection determine the fact that the provisions of this act are not being complied with, said Department of Buildings, Health Board or health officer, or other officials exercising jurisdiction, shall at once issue a written order to the trustees, corporation or public officers having charge of, owning or leasing said school house or public building, requiring the immediate correction of the violation found, giving such time for their correction as may be deemed best for the public welfare

Sec. 5. All school houses and public buildiugs for which plans and a detailed statement shall be filed and approved, as required by this act, shall provide that all halls, doors, stairways, seats, passageways and aisles, and all lighting and heating appliances and apparatus, shall be arrauged to facilitate egress in case of fire or accident, and to afford the requisite and proper accommodations for public protection in such cases.

All exit doors shall open outwardly, and shall, if double doors be used, be fastened with movable bolts operated from the inner face of the door.

No staircase shall be constructed with winder steps in lieu of a platform, but shall be constructed with straight runs, changes in direction being made by platforms; the rise of said staircases shall not exceed 8½ inches to a step and shall not be less than 9 inches tread, exclusive of the nosing.

Hand rails shall be provided on either side of all staircases.

No door shall open immediately upon a flight of stairs, but a landing at least the width of the door shall be provided between such stairs and such door.

Every public building or place of assemblage accommodating 500 persons shall have at least two exits of not less thau 5 feet in width, and for every additional 100 persons or portion thereof to be accommodated in excess of 300 an aggregate of 20 inches additional exit width must be allowed.

The stone or brick work of the smoke flues for all boilers and furnaces shall be at least 8 inches in thickness and shall be properly capped with stone or other similar material; the inside 4 inches of said flues shall be of fire brick laid in fire mortar for a distance of 25 feet in any direction from the source of heat. All smoke flues other than for boilers or furnaces shall be lined ou the inside with cast iron or well burnt clay or terra cotta pipe, made smooth on the inside, from the bottom of the flue or throat of the fire place and carried up continuously to the top of the flue, each section of the pipe to be built in as the flue or flues are carried up, each side of each flue to consist of not less than 4 inches of brick work, well bonded together; no flue shall be started or built upon any floor or beam of wood, neither shall any flue, beam or joist be placed within 6 inches from the interior of a flue, and no wood casing, furring or lath shall be placed against or cover any smoke flue. or metal pipe used to convey hot air or steam, but in the case of flues for hot air or steam this shall not prohibit the covering of said flues with metal lath and plaster, with an air space of ⅞ inch, and the placing of the wood work directly thereon. No stove pipe shall be placed nearer than 9 inches to any lath and plaster or board partition, ceiliug or wood work, and in the case of furnaces such distance shall be from 15 to 30 inches, unless properly protected with metal, but in no case shall the distance be less than 13 inches.

No vertical hot air pipe shall be placed in any stud partitions or in a wood inclosure uuless it be at least 8 feet distant in a horizontal direction from the furnace. Steam or hot water pipes shall not be placed withiu 2 inches of any timber or wood work.

In the construction of fire escapes the balconies shall be made so as to be easily accessible from the different floor levels, and the rails thereof shall not be less than 30 inches in hight. No iron ladders shall be used in connection with any fire escape, but there shall be provided iron stairways, with a tread of not less than 7 inches and a rise of not more than 9 inches, protected with proper iron hand rails.

Sec. 6. The words "school house" as used in this act shall be taken and deemed to mean any building in which public or private instruction shall be given to not less than ten pupils at one time; and the words "public building" as used in this act shall be taken and deemed to mean any building or premises used as a place of public entertainment, instruction, resort or assemblage, or for the purpose of transacting public business of any kind or uature whatsoever, when there shall be more than ten persons in any such building at any one time.

Provided, however, that this act shall apply only to cities and incorporated villages.

Sec. 7. Any violation of this act or failure to comply with its provisions by any school committee, public officer or corporation or other persons whatsoever shall be a misdemeanor.

Sec. 8. This act shall take effect July 1, 1902.

R. Wilson & Son, Springfield, Mass., have just secured the contract for the plumbing work in two houses now being erected by F. W. Lathrop on Wilmot street.

ASSOCIATION NEWS.

Baltimore Master Plumbers.

The annual meeting of the Master Plumbers' Association of Baltimore, Md., was held in the Builders' Exchange on March 13, when the following officers were elected for the ensuing year:

President, Lloyd Mitchell.
First Vice-President, Samuel Bennett.
Second Vice-President, E. J. Burke.
Financial Secretary, C. H. Frederiek.
Treasurer, J. McCrea.

The following were eleeted delegates to the convention of the National Association at Atlantic City in June: John Trainor, P. T. Barry, Lloyd Mitchell, William H. Rothrock, W. W. Rose, Thomas Bowling, Edward Koethe, Edward Zimmish, Henry Bowman, Allen Bean, William Alford, E. J. Burke, William J. McCrea and James Traynor.

Master Plumbers' Association of Queens, N. Y.

The annual meeting of the Master Plumbers' Association of Queens Borough, New York City, was held Wednesday night at Jamaiea. It was resolved to hold future meetings at Long Island City. Delegates to the State Convention at Elmira reported that action was taken against the Fowler bill, now in the Assembly, which would allow a plumber holding a State license to work anywhere in the State without taking out a local license. The following officers were elected for the ensuing year:

President, Philip Scott, Far Rockaway.
Vice-President, George Perry, Jamaica.
Secretary, Henry Bawman, Woodhaven.
Financial Secretary, John F. Rogers, Flushing.
Treasurer, John Anderson, Flushing.
Executive Board: George M. O'Connor, Philip Scott, George Perry, John Anderson and John F. Rogers.

RUSTY TUBE CAUSES CIRCULATION PIPE TO BURST.

BY J. N. S.

The other day I had occasion to repair the lead elreulating pipe between the water back and a galvanized boiler, which had beeome so expanded and weak that it burst. Upon examining the water back I found that it was clean and, of course, had to look further for the trouble. The boiler was almost new and the lady of the house informed me that it was scareely a year since it was put in. So I thought it would be wise to look at the bottom eonnection on the boiler. After diseonneeting the eoupling on the spud, I put my finger up into the spud, when, lo! it was covered over with thick, rusty scales. Thinking this strange for a new boiler, I took it down and examined the tube. Such a filthy article could scareely be coneeived. It was almost eaten away with rust. The plumber who renewed the boiler put the old tube back again. I eannot believe that he did so because it was cheaper to do it in this manner; but I believe he did not know any better, or else was a very eareless workman. How much more would 4 feet of ½-inch galvanized pipe have cost? Moral: Never replace a boiler unless you renew the tube at the same time.

The upshot of the whole trouble was that the scales of rust prevented the water back from getting water as freely as it required, and, as a natural result, it generated steam, and the constant hammering of this steam against the water in the upper pipe burst it. It might be said if the elreulating pipe was iron it would not have burst. Well, maybe not, but the water back would, and that would have been much worse. Now it strikes me right here that if 4 feet of ½-ineh pipe was used for a tube it would not matter how often the boiler was replaced, the same tube could be used and this at once would make it impossible for such a necessity to occur as the replacing of an old tube in a new boiler.

Mott's New Boilers and Radiators.

Evidence of the popularity of the steam and hot water boilers and radiators made by the J. L. Mott Iron Works, 84 to 90 Beekman street, New York City, is shown in the neeessity that has arisen for better office and showroom faeilities for this line of goods. This department of the company's business has been moved to the seeond floor of their building, where the whole space is devoted to it, the office occupying one end of the floor and the boilers and radiators in different styles being so arranged that they can be seen to the best advantage. This department has been fitted with a hard wood floor and the side walls and ceilings finished very attractively in different tints of green.

The company have a new catalogue in course of preparation which will be ready for distribution in the near future. The eatalogue will show a new plain two-column radiator for steam and hot water, made in the usual hights and also a new and very attractive design of wall radiator. It will also present several new steam and hot water boilers of the vertical sectional type and of the flue arrangement, designed to attract the principal heat from the burning gases, as well as to present a large surface to the direct effect of the fire.

An Electric Radiator.

The increasing use of eleetricity for domestic purposes renders interesting some account of a new electrie radiator which has been brought out in London, England, and referred to by the *Architect* as follows: The deviee consists of a movable form, something like an asbestos fireplaee. It eontains four large electric heat lamps in a polished eopper reflector. The heat is generated by eurrent from an eleetrie supply main. All that is necessary to fix them ready for use is to connect the flexible wires attached to eaeh radiator to an electric plug which forms part of every installation. For high or low voltage they are equally adapted, heat lamps of the requisite eapaeity being supplied, and work satisfaetorily on alternating or continuous current. The standard size of these radiators consists of four heat lamps, sufficient to warm the air of a room 12 feet square, with a eonsumption of 1 unit per hour, but they ean be regulated to one-half by means of the switehes attaehed. For larger rooms or halls two or more radiators ean be used, or radiators can be supplied of a design eontaining six or more lamps, although the first method is preferable, as the heat can be taken to the point where most wanted, a special feature being their portability. But the most important is that they provide pure warm air, no oxygen being consumed by them, nor are any noxious fumes given off. Their appearance is certainly bright and cheerful, and there are no ashes or dirt to be removed after their use.

Paint for Hot Steam Pipes and Radiators

A painter desired to know how to make paint for radiators when there was objection to an addition of oil for a binder for the reason that linseed oil is said to form a non-porous eoating that prevented the transmission of heat. He also desired to know what he should mix with vermillon to have it retain its gloss for a reasonable time on hot steam pipes.

In reply the *Painters' Magazine* says: "Radiator paints are usually made very similar to baking enamels and consist of pigments and fatty varnishes that bake on the metal by the aid of the heat in the pipes. To suit well for the work the pigments must be ground in varnish to the utmost degree of fineness and thinned with a speeial varnish to proper consistency for free application. If the owner objeets to linsced oil, he might equally objeet to painting the radiators at all, unless he speeified that the same be lacquered or done in dry bronze. Even in that case a binder is required to hold the bronze onto the metal, though it would not mean snch a heavy coating as in the case of solid painting.

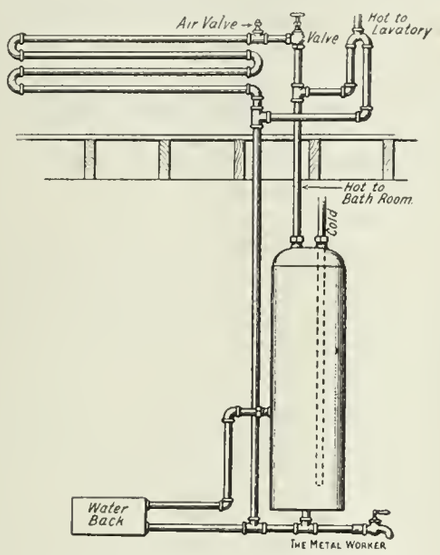
In mixing paints for steam radiators do not use oil colors, nor add linseed or any other oil, raw or boiled, but

use colors ground for coach work, and thin with good, free working baking varnish, so that the paint will no more than just cover. In this way there will be no blistering, and the gloss will be retained. Use a bright red of good bulk, ground in varnish, for hot steam pipes, and thin to the fullest extent with a good pale baking varnish, and the gloss will be more permanent.

COILS FOR BATHROOM HEATED BY WATER BACK.

BY HELMAR.

It is frequently desirable to heat the bathroom or a back chamber in dwelling houses by means of hot water from the kitchen boiler and range water back. The mechanical work in these cases is so simple that it can be readily done. It is only necessary for the workman to be sure that there is sufficient water heating capacity before he attempts the job. If a cooking stove or range has a fire box of sufficient size, and the water heater



Coils for Bathroom Heated by Water Back.—Fig. 1.—Coil Connected with Circulating System.

presents a large surface for the hot coals to lie against, heating the water in the boiler so that it sometimes causes a rumbling, or if the boiler is filled with hot water from top to bottom, it may be assumed that there is a sufficient water heating capacity to take care of a small radiator on the floor above, without reducing the temperature of the water for domestic purposes sufficiently to interfere with its usefulness. This point must be determined before the work is begun, otherwise it may be found, after the expense has been assumed, that the looked for benefit is not forthcoming.

Bathroom coils heated by range boilers are quite common and give better service where properly installed than many of the kerosene and gas heaters and dwarfish stoves employed. They are cleanly and odorless, but the range and water back must be of liberal size and fired throughout the day to get good results. The accompanying sketches show the simplest kinds of piping arrangements, and they may be modified to suit conditions. In a circulating job, as shown in Fig. 1, the return circulating pipe may be made to serve as a return for the coil, thus saving one line of pipe. Some plain jobs may be easily changed into return circulation jobs when a coil is added to the work. In this way the plumbing service is improved in addition to utilizing the surplus heating capacity of the water back during the winter months. Pipe coils are used most because the room they occupy is usually least available for other purposes. "Pitched," or common open pattern return bends are used, the pitched fittings being confined to short coils because long pipes will spring either for "fall" or to permit making up with right hand threads. Ornamental fittings, wall plates and binders can be had if desired. There is little danger of getting a coil too large in a small bathroom. Six or eight straight 1-inch or ¾-inch pipes along the longest blank free wall space is the usual size.

A direct connection between the water back and the heating coil is shown in Fig. 2. The flow should enter the coil at the top, and have a valve to check the circulation where the flow enters the coil. A small hole drilled through the valve disk will prevent the coil from freezing should the valve be closed. An air cock should

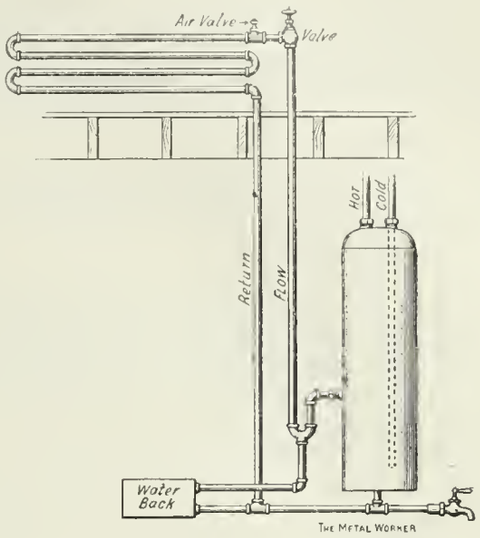


Fig. 2.—Direct Connection Between Water Back and Heating Coil.

be placed on the highest point of the coil to let the air out so that the coil will fill the water. The air cock should be opened from time to time to see that air is not impeding circulation. Air separates from water when heated, and enough may collect in the coil in this way to stop circulation.

Stop valves or cocks on both pipes are not usual, but may, if desired, be placed somewhere below the kitchen ceiling. Stop and waste cocks that will admit of draining the coil are best. These stops have nothing to do with the valve for controlling the circulation, before mentioned. It should be put in whether the stops are or not. Hot water radiators do as well as coils. A steam radiator will not answer for hot water, however; the circula-

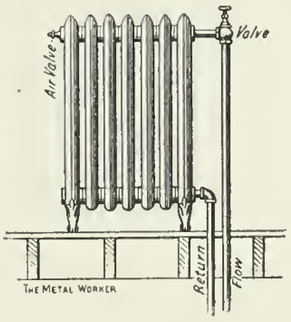


Fig. 3.—A Radiator Connection.

tion would be poor or fail entirely, and each loop would have to be provided with an air cock. A method of connecting is shown in Fig. 3, that will give excellent results, but a better looking job is made by using a regular hot water radiator and connecting the flow and return at opposite ends at the bottom.

New York City Notes.

The Campbell Supply Company of East Fifty-fourth street have opened a branch on Columbus avenue between Eighty-ninth and Ninetieth streets. This branch should do well and fill a long felt want in that vicinity.

* * *

The journeymen plumbers have at last got together, uniting as Local No. 2 of the United Association of Plumbers and Gas Fitters. At their meeting, held on the 16th inst., they voted to act as one body, doing away with the various councils which were a feature of the old Brotherhood.

The wage question is still unsettled, but many rumors are going around as to what will be asked, some going as high as $4.50. The Saturday half holiday and the doing away with apprentices and also with juniors after a certain time are features that are likely to be brought forward.

* * *

A few plans are passing through the Building Department, but most of them are for alterations. The trade still continues quiet, but many are waiting for their jobs to get up to the plumbing stage so that they can get to work.

* * *

John Boyd, who is one of the busy plumbers, is well along with his work in the Knox Building, at Fifth avenue and Fortieth street.

* * *

The members of the Irish Athletic Club presented their treasurer, T. J. Cummins, with a handsome gold badge, studded with emeralds and diamonds, on St. Patrick's Day as a testimonial of the hard work he has done for the club.

* * *

President A. H. Brown of Manhattan Branch has again been honored by a unanimous re-election as president of the village of Tarrytown, where he resides.

Heating and Plumbing Notes.

THE master plumbers of Dayton, Ohio, have either forestalled or invited trouble by posting notices in their various shops stating that on and after Monday, March 10, the establishments would be conducted as open shops, not nonunion, but open for nonunion and union men alike. It is said that the announcement, which is a great surprise to union plumbers, was brought about by the reported discontent of the men, and for the purpose of forestalling a possible strike.

THE BOARD OF EXAMINING PLUMBERS of Syracuse, N. Y., have organized, with Frank J. Schnauber, City Engineer, as president, F. W. Waggoner as secretary, and E. B. Dunkerton as a new member of the board.

JOHN CARNEY, a prominent plumber of Utica, N. Y., died at his home, 43 Cottage place, on March 10, aged 60 years. In 1871 he entered into partnership with his brother, P. H. Carney, in the Plumbing Supply business, in which he was engaged at the time of his death. He at one time served as alderman in the city, and was connected with a number of public enterprises. Twenty-five years ago he married Ellen Condon, who survives him with five children. He was prominently identified with St. Patrick's Church, having been its treasurer for 25 years.

THE headquarters of the English Acetylene Association are at 11 Ironmonger Lane, London, E. C., in charge of the secretary, Lacey Downes.

GEORGE SOULE, Billings, Mont., has been awarded a $6000 contract for plumbing and heating the residence of P. B. Moss, which is said to be one of the finest in Eastern Montana.

ERNEST G. BATES has resigned from the Board of Plumbing Examiners at Springfield, Mass.

JAMES W. BROWN, Fair Haven, Conn., has moved his plumbing business to one of the stores in the Chamberlain Building on East Grand avenue.

JOHN C. KUPFERLE, St. Louis, Mo., reports an excellent demand for his lines of Plumbers' Supplies and Hardware Specialties. He is enjoying an especially large business in Water Works Supplies this season.

THE English trade journals intimate a probability of trouble in the Sanitary Ware trade in that country, owing to a controversy over wages. The manufacturers have announced to the men their intention of cutting down wages as much as 25 per cent., and already some firms have made a reduction of from 7½ to 12½ per cent. on prices paid for the manufacturing of some of their goods. The men are resisting this reduction and have suggested to the manufacturers that a uniform scale of prices be agreed upon whereby the necessity for a reduction of wages will be removed. It is hoped that the dispute will be settled without any great disturbance of the trade.

A FIRE visited the plumbing establishment of F. A. Sheiderveiler, Corning, N. Y., last week.

THE team selected by Captain Emery to represent the Plumbing and Steam Supply League in the Business Men's Championship Bowling Tournament have already reflected credit to his judgment. The team met what is said to be the "crack-a-jacks" of the new league, and, although Captain Emery scored 214 and Secretary Wilson 205, yet the 819, 848 and 795 scored by the team, while very good, could not win against the 909, 855 and 845 of the Commercial League team. It was a good showing, however, and they will give a good account of themselves before the contest is closed.

A DISPLAY is being made at the New York office of Isaac A. Sheppard & Co. of Philadelphia, at Beekman street and Peck slip, of the Paragon Tank Heaters and Laundry Stoves. These Tank Heaters are made in a variety of styles and sizes adapted to heating from 65 to 300 gallons of water. The firm report an increasing demand for the Paragon line among the plumbers in the vicinity of New York. Their Laundry Stoves are made in a variety of styles adapted for heating from 10 to 28 sad irons. These Stoves are also equipped with Water Heaters of different capacities.

J. B. WEIANT, New Britain, Conn., is engaged in plumbing a house for Caspar Rowe. He also has the contract for plumbing several houses for Parker & Wetmore, a six-tenement block for Carlson & Torrell and some fine work in a house owned by Mr. Simms, at Kensington.

THE PIERCE, BUTLER & PIERCE MFG. COMPANY, Syracuse, N. Y., are sending to the trade a neat little pamphlet devoted to the Pierce Sanitary Wood Work, which shows, in addition to Flush Tanks in various styles for low down closets, Closet Seats. These are made of different kinds of wood in different finishes.

GEORGE H. STIBBS, Hartford, Conn., has recently installed new furnaces in the residences of J. D. Dillon and P. A. King in that city. He has also placed a furnace in the new opera house at Stafford, Conn.

THE authorities of Duluth, Minn., are considering the advisability of creating an office for the inspection of plumbing, as the result of a request coming from both house owners and plumbers, who urge that the health of the community may be endangered by neglect, which would be impossible under properly administered plumbing laws and inspection officers.

D. H. KELLY, Derby, Conn., bid $1745 and has been awarded the contract for heating and ventilating the new Franklin Street School in that city.

GEORGE C. MORRELL of the firm of Brown & Morrell presided as temporary chairman, and W. S. Washburn as secretary, at the meeting of the master plumbers of Brockton, Mass., on March 15, for the purpose of organizing a master plumbers' association.

FRITSCH BROTHERS, 174 Centre street, New York, who manufacture a variety of Thermometers adapted for the use of the heating trade, are sending out a catalogue giving illustrations and descriptions of their different Thermometers.

SMITH & COTTER, Springfield, Mass., are renovating the plumbing in a house on Greenwood street belonging to E. C. Fitzgerald.

A SUIT has been brought against the owner of a tenement building in Chicago for damages caused by the death of two children, said to be due to the escape of sewer gas from a faulty plumbing system.

C. L. WRIGHT & SON, New Haven, Conn., are drilling an artesian well for Joseph Kegelmeyer.

THE Plumbing Supply house of Fleck Brothers Company, 54, 56 and 58 North Fifth street, Philadelphia, are making extensive alterations in their showroom, which will be 25 x 75 feet in size and fitted with plaster columns, tiled wainscoting, tiled partitions and mosaic floors. It is the intention of the company to make it the handsomest plumbing showroom in the city.

H. W. Tombs, a well known Boston plumber, died at his residence in Cambridge on March 14. He was suddenly taken ill while riding in an electric car, and was taken to the Cambridge Hospital, where he died.

One of the features of the last issue of *Shop Talk*, issued by Hill, Clarke & Co. of Chicago, is a description and illustration of an electrically driven Pipe Threading and Cutting Machine. The machine is made by the Bignall & Keeler Mfg. Company of Edwardsville, Ill.

Fred. Adee & Co., 90 Beekman street, New York, are sending to the trade an illustrated circular showing their Defiance Water Closet with Zenith Valve. By the use of the Zenith Valve the necessity of flushing the tank is done away with, the closet being supplied with water from the regular service pipe, and it being only necessary to push a button to thoroughly flush the closet. It is claimed that the Zenith Valve is not affected by sand or grit in the water, and an investigation of it by the plumbing trade is invited by the manufacturers.

The new tube plant of the Eastern Tube Company, at Zanesville, Ohio, is in full operation, turning out about 400 tons of Pipe daily.

The Caldwell Furnace Company of Toledo, Ohio, have been reorganized and incorporated under the laws of New Jersey with $300,000 capital stock. The company have purchased a large foundry and furnace at Fort Payne, Ala., which have been consolidated under one head with the old Smead plant in Toledo. At the Toledo plant the company are manufacturing Blowers, Fans, Galvanized Pipes, as well as furnace castings. It is stated that both plants will be enlarged.

The Detroit Leather Specialty Company, Detroit, Mich., have just issued a finely printed, illustrated descriptive catalogue of what they call the "Wear Well" Leather Packings. These Packings are designed particularly for various kinds of hydraulic construction, and they undertake to follow a customer's specifications, giving, it is stated, perfectly formed Packings that fit and stand the Government test of 5000 pounds. In Cup Leather Packings they can furnish from 1 to 36 inches diameter inclusive, any sized center hole, and cupped to a depth of 3 inches.

The Incandescent Light & Stove Company, Cincinnati, Ohio, issue a booklet, entitled "Why are Gasoline Lighting Systems Persecuted by the Underwriters' Laboratory and the Committee on Fire Protection Engineering?" in which they point out that gasoline lighting systems, and especially their F.-P. Lighting System, are not more hazardous and are in many respects safer than gasoline devices which are permitted by insurance boards. The company challenge any one to show where a single accident has been caused from any source with 2000 incandescent Gas Machines built by them six years ago, and 4000 F.-P. Machines with safety escape pipe connected to the governor, which they have put out since March 1, of last year, all of which are said to embody the so-called hazardous features.

J. H. Edwards, 59 Park Place, New York City, has furnished us with a copy of the latest catalogue of the Aermotor Company, Chicago, Ill., of which he is the Eastern representative. The catalogue is a publication of 40 pages, profusely illustrated, and containing full description of the Aermotor Wind Mill, manufactured by the concern. The various features of this device are given at length, together with instructions for its erection, operation and preservation. Information regarding steel towers for Wind Mills is also provided, as well as a large amount of detailed information in regard to pumps and tanks for use with these Wind Mills. A table at the end of the book gives sizes of wheels, piping and cylinder for various depths of well. Mr. Edwards reports that the demand for the Aermotor in his district is constantly increasing and the outlook is favorable for a particularly large business in this line during the present year.

He: "Do you mean to say the plumber has not been here yet?"

She: "No—isn't it shameful? And we are such good customers; our plumbing is nearly always out of order!"—*Brooklyn Life.*

New Firms and Changes.

J. Frank Burt, formerly of the firm of Balman & Burt, Winchenden, Mass., has bought the stock, fixtures and business of G. F. Gilpatrick, at Wilton, N. H., and will conduct there a plumbing and tinsmithing business.

The Maryland Sanitary Refrigerating, Ventilating & Heating Company have been incorporated with a capital of $200,000 by Charles H. Basshor, David M. Newbold, William W. Varney, W. H. Wheedon and Marion De K. Smith.

F. A. Pipper, T. O. Bateman and H. L. Benson have incorporated the Texas Crude Oil Burner Company at San Antonio, Texas, with a capital stock of $50,000, to manufacture Crude Oil Burners for heat and light.

C. J. Arnold and Walter Howard of Pittsburgh, Pa., have purchased from Alfred Catchpole of Geneva, N. Y., his boiler and radiator patents and business and will retain him as consulting engineer.

B. A. Warlick & Co. are a new firm who are opening up a steam, hot water and hot air heating and sheet metal business at 79 and 81 Edgewood avenue, Atlanta, Ga. The firm say that they are in the market for machinery and materials in their line, and would also be glad of catalogues from manufacturers and jobbers.

The Moncrief Plumbing & Tinning Company, Jacksonville, Fla., have been incorporated with a capital of $10,000 by R. L. Moncrief, Jos. A. Schreiber and R. F. O'Shields.

The Hygienic Filter Supply Company of New Jersey, with office at 15 Exchange place, Jersey City, have been incorporated with a capital stock of $25,000 by William N. Winslow, Roswell H. King, William H. Ross, William H. Ross, Jr., and Robert L. Fleming, to manufacture Filtering Apparatus.

Tribus & Massa are a new firm of consulting civil and hydraulic engineers at 84 Warren street, New York, who make a specialty of the designing and construction of water supply, sewerage and water power systems. Louis L. Tribus, who has conducted a consulting engineering business at this address for a number of years, has associated Charles G. Massa with himself, owing to his public duties as Commissioner of Public Works for the Borough of Richmond. Mr. Massa is a graduate of the Columbia University School of Mines, class of '89, and has been engaged in the construction of railroads and water works.

Miller & Talbot succeed the firm of Hoey & Miller in the plumbing business at 202 East Bridge street, Grand Rapids, Mich.

Armstrong & Munger are a new firm in the plumbing and tinsmithing business at Hudson, Mich., Ralph Armstrong having sold a half interest in his business to C. D. Munger. The business will be conducted at the old stand of Mr. Armstrong on East Main street.

The Marshall-Cosby Company is the title of a new manufacturing concern in Port Huron, Mich., who will manufacture Plumbing Specialties. E. M. Marshall is said to be a leading spirit in the enterprise.

The Cold Air & Ventilation Company, with a capital of $1,000,000, have been organized at Pittsburgh, Pa., to introduce the invention of a Pittsburgh man for a system of furnishing cool air by the use of chemicals. He has been working on the plan several years, and claims he can undersell any ice company or refrigerating plant.

The J. A. Skelly Plumbing & Heating Company have been incorporated with a capital of $5000 at Wilkinsburg, Pa.

The American Warming & Ventilating Company have been incorporated at Pittsburgh, Pa., with a capital of $25,000.

The Huxley Valve Mfg. Company have been incorporated at Louisville, Ky., with a capital stock of $15,000, by Frederick Wahl, Chas. E. Huxley of Quincy, Ill., and Thomas L. Jefferson.

Short Calculations for Roofers.

BY I. N. PHILLIPS, NASHVILLE, TENN.

It very often happens in the regular routine of business that it is necessary to calculate the number of square feet in a length of valley, a number of sheets of corrugated iron, stamped siding, and the like, the width of which is in odd inches, and unless the workman is well up in decimals it is sometimes a little tedious to work out the operation according to the old time honored and orthodox way of reducing all to square inches and dividing by 144. For the benefit of those who are a little short on mathematics I send you a simpler method, which is accurate and easily remembered. The rule is: Multiply the length in feet by the width in inches, and divide by 12. The result is in square feet. Now the first thing that pops into the orthodox head on reading this rule is that if you multiply feet by inches you get neither square feet nor square inches, but a mongrel which is neither. I will not affirm nor deny, but leave the interested one to work out the solution, with the assurance that the rule is absolutely correct. Given a valley 257 feet long and 47 inches wide, find the number of square feet:

LONG METHOD.

257
12
514
257
3,084
47
21,588
12,336

144) 144,948 (1,006 7/12
144
948
864
84 = 7/144 = 7/12

SHORT METHOD.

257
47
1,799
1,028

12) 12,079 (1,006 7/12
12
079
72
7
12

It will be observed that there are 60 figures in the long method, and 37 in the short method, a saving of over 38 per cent. in figures, and presumably in time, which fact will probably appeal to our brethren of the strenuous persuasion.

Directions for Laying Felt Roofing.

The following directions for laying felt roofing are given in a pamphlet issued by Meurer Brothers Company of Brooklyn, N. Y., in the interests of their Meurer's felt roofing:

Have the roof smooth and free from obstructions. Sweep clean and lay the roofing with a slope. It may be laid parallel with the gutter, if desired. When laying parallel with the gutter, start at the bottom and work up; turn down about 1 inch over the edge and commence nailing at the middle, nailing both ways. Place the nails 2 inches apart on centers, about ¾ inch from the edge, using caps and lapping the next course 2 inches over the first. Cement well before nailing. Always lap the butts 4 inches, cement thoroughly and see that the nails and caps are thoroughly coated.

On roofs with a pitch of less than ¾ inch to the foot use a 3-inch lap on seams and 4-inch laps on butts as before. On the metal edge strips or wooden battens may be used in place of caps and nails. Use cement freely and see that the strips are well coated.

In the case of side walls, turn up the roofing about 3 inches; cement surface next the wall and secure with a wooden strip. Cement inside edge, taking special care with the seam next the wall. In case of chimneys, &c., turn up about 3 inches. Coat a separate strip of roofing to fit down over this, securing it at the top with a wooden strip, and cement well. When the roof is laid with a slope, half round wooden moldings may be substituted for caps and nails on the seams. Longer nails should be used, cementing as usual. Gutters may also be lined with felt roofing.

A HOPPER REGISTER BOX.

BY J. K.

Having been asked to explain what we meant by a hopper register box, as mentioned in our contribution in *The Metal Worker*, January 25, we present herewith an illustration, Fig. 1, and patterns of the hopper register box as we make it. It will at once be noted that the boxes, after the patterns are cut, are very easily made and are good goods to handle and show prospective customers when talking up work. It will be readily seen that the air starts to spread over the full surface of the register from the collar to the top of box, and there is nothing to interfere in any way with the register valves or a free outflow of the air.

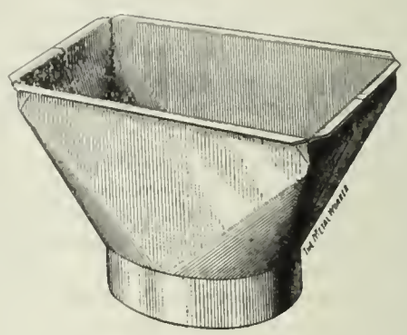


Fig. 1.—A Hopper Register Box.

We do not put this box forward as something entirely new, as we know of it being used by many good furnacemen for years. All we hope is that it may become much more commonly used, and prove to others, as it has to us, one of the little things that help to make the

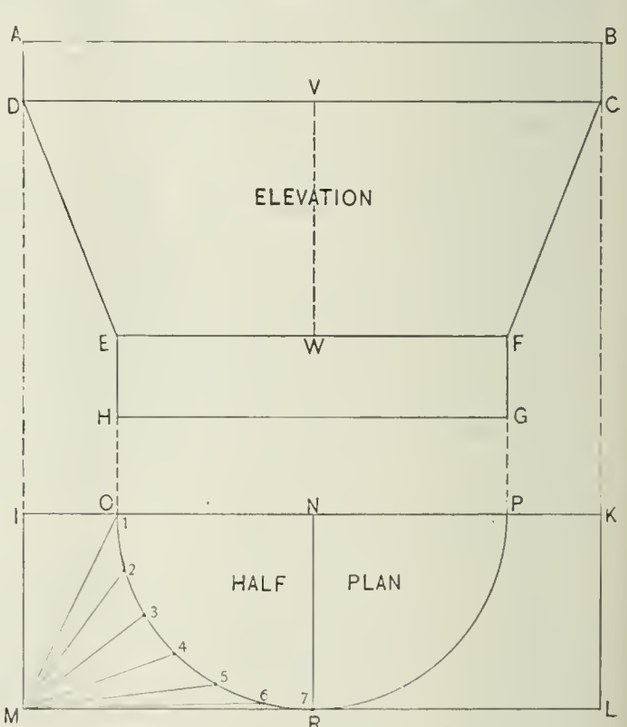


Fig. 2.—Plan and Elevation.

warm air furnace a success and sought after by those who really want something good.

The way we get the patterns for this box is a simple problem in triangulation, and we would advise using this method in getting out the patterns for all stock sizes at least. The hopper is shown in elevation by A B C F E D in Fig 2. The top square part made to receive the register is represented by A B C D, the hopper proper by D C F E, and the round collar at the bottom of the hopper, to which is fitted the hot air pipe, by E F G H. The half plan of the top of the hopper is represented by I K L M and the half plan of the round bottom part by O R P. To find the pattern of the hopper, D C F E, and the top square part, A B C D,

which are made in one piece, divide the quadrant O R into any number of equal spaces, as shown by the figures 1, 2, 3, 4, 5, 6 and 7. From the point M draw the lines M 1, M 2, M 3, M 4, M 5 and M 6, which show the horizontal distances between the point represented by M in plan and D in elevation and the points on the quadrant.

To find the true distances between this point and the points on the quadrant draw in Fig. 3 the base line T U. At T erect the perpendicular T S, equal to the vertical distances between D C and E F in Fig. 2.

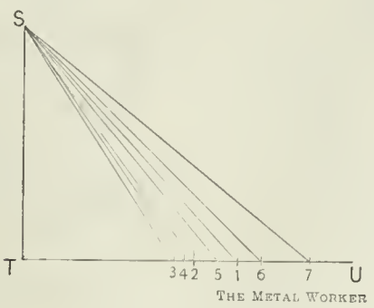


Fig. 3.—Diagram of Triangles.

From T on the line T U lay off the horizontal distances between M and the points on the quadrant, making T 1 equal to M 1, T 2 equal to M 2, &c. From the numbered points thus obtained on the line T U draw lines to S. These lines will represent the true distances from M in plan, which is the same as D in elevation, to the numbered points on the quadrant O R in plan, which is E W in elevation.

To make the pattern as shown in Fig. 4 draw A′ B′ C′ D′ equal to A B C D in Fig. 2 It will be seen from the plan in Fig. 2 that the line L M and the point 7 of the arc O R P meet at R, so that the vertical distance between the points V and W in Fig. 2 is equal to the actual distance between these lines. Therefore, in Fig. 4 let fall from the center of C′ D′ a perpendicular whose length is equal to V W, the vertical distance between D C and E H in Fig. 2, and call the bottom point of the line 7′. Now from 7′, with a radius equal to one of the spaces on the quadrant O R in Fig. 2, strike arcs, and from D′ and C′, with a radius equal to S 6 in Fig. 3, draw arcs intersecting these, marking the intersections 6′. From the points 6′ strike arcs with a radius equal to the spaces in the quadrant in Fig. 2, and intersect these with arcs whose centers are D′ and C′, and which have a radius equal to S 5 in Fig. 3, calling these points 5′. Proceed in a similar manner until points 1′ are reached. Trace a curve through the points thus obtained.

From D′ and C′ in Fig. 4 strike arcs equal to I M in half plan in Fig. 2 and intersect these with arcs struck from 1′, with a radius equal to D E in Fig. 2, calling the intersections D″ and C″. Draw the lines D″ D′ and C′ C″. From the points D″, D′, C′ and C″ erect perpendiculars equal to A D in Fig. 2, and connect the top of these perpendiculars, so as to form the rectangles A‴ A″ D′ D″ and C′ B″ B‴ C″. Draw the lines D″ 1′ and C″ 1′. Then will the figure A‴ A″ D′ A′ B′ C′ B″ B‴ 1′ 7′ 1′ be the pattern for half the hopper, no allowance being made for laps.

Attention is called to the way that the joints on the square top of the hopper are made, as shown in Fig. 1, and also to the floor flange which has been provided and which is an essential part of the hopper. It is usual to make the square box to receive the register about 2 inches deep. After forming up and grooving a collar is put on the bottom of the box, as shown in Fig. 1.

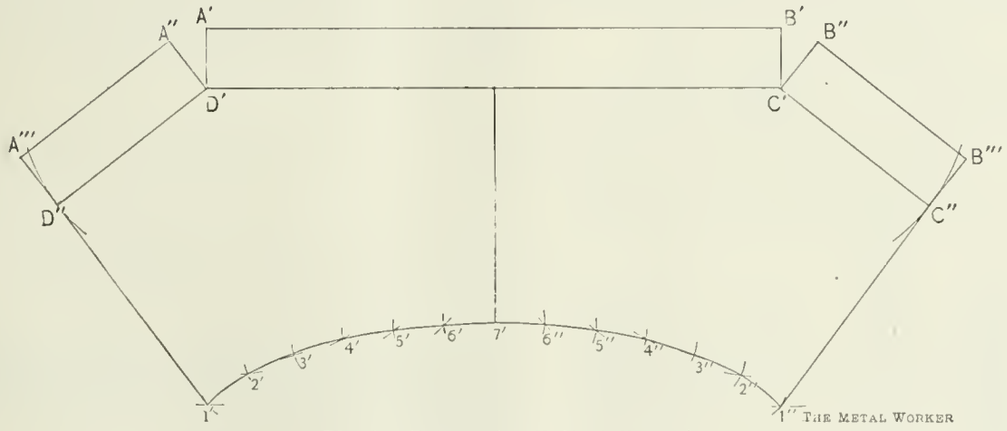


Fig. 4.—Pattern for Half of Hopper.

SHEET MILL WAGE AGREEMENT.

At a meeting of officials of the American Sheet Steel Company and representatives of the Amalgamated Association of Iron, Steel and Tin Workers, held in the Vandergrift Building last week, an arrangement for a continuous sheet wage scale was made. The present scale expires June 30, but under the terms of the contract made last week there will be no stop of work pending the formation of a new wage scale, should one not be agreed upon by the time the present scale expires. The agreement is something similar to that recently made between the Amalgamated Association and the American Tin Plate Company, and insures steady work in the sheet mills through the summer months. The agreement will have to be ratified by the Amalgamated Association at their convention in Wheeling in May, but no trouble is expected on this score.

The Empire Iron & Steel Company.

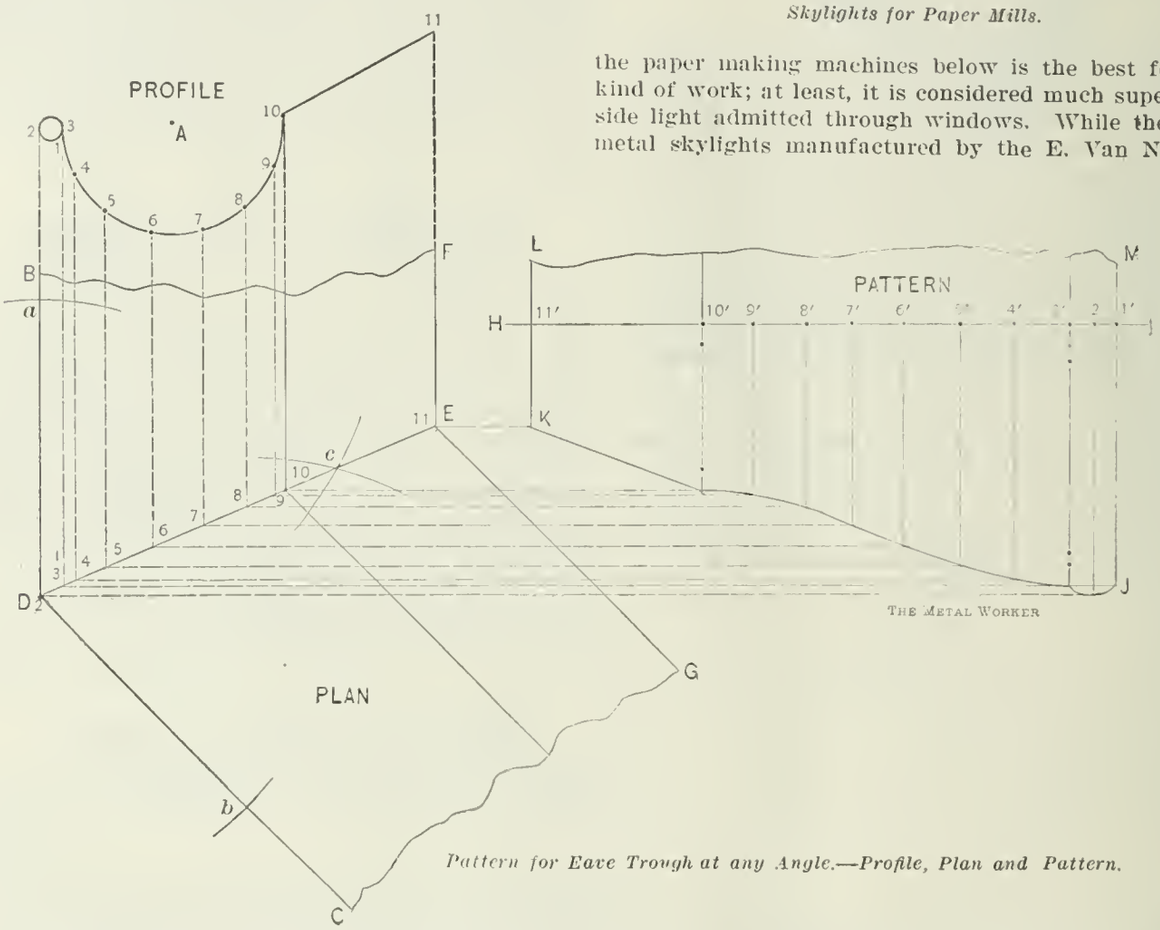
The Empire Iron & Steel Company have been organized and will build a plant at Niles, Ohio, for the manufacture of iron and steel sheets. The concern have secured 15 acres of land at Niles and will probably buy 15 acres more. The promoters of the company are Wade A. Taylor of Niles, Charles S. Thomas of Struthers and Jno. F. Odea of Youngstown. The initial plant will consist of four sheet mills and a bar mill, as it is the intention of the concern to roll their own bars. A galvanizing plant will also be erected to make galvanized sheets. The new concern will also roll small sections of T rails and state the rail mill will have an output of about 100 tons in 24 hours. Chas. S. Thomas was secretary of the Struthers Iron & Steel Company until the formation of the American Sheet Steel Company, since which time he has been manager of the Struthers Works of this concern.

It is considered that the question of payment by area is likely to be the chief doubtful factor in the renewal of the wage scale in the Welsh Tin Plate trade this year. Some Tin Plate workers in South Wales are paid by weight, with special rates for light plates, while the majority are paid by area. The workingmen's union, at a recent meeting, decided that the proper time had come to arrange for a uniform system of payment by area in all the Welsh Tin Plate mills.

PATTERN FOR EAVE TROUGH AT ANY ANGLE.

With the coming of the spring months eave troughs will be required on many buildings, owing to ice having damaged the old ones. In making the troughs a large bead of ½ inch diameter is usually placed on the outer edge and a flange to run up under the shingles or slates on the roof side. In some cases the troughs are beaded on both sides and hang directly under the eaves. However, no matter what the shape of the trough may be or whatever angle the building has, the pattern is obtained as shown in the accompanying diagram.

Let A represent the profile of the trough which is to run around the building, having an angle equal to B D C in plan. The first step required is to obtain the miter line D E by bisecting the angle B D C, as follows: With D as center and any radius describe arcs, intersecting B D and D C at *a* and *b*, respectively. Then, using *a* and *b* as centers and any radius more than *b* D in length, describe arcs intersecting each other at *c*. Draw a line from D to *c*, extending it to E, which is obtained from the point 11 in the profile. Draw the line E G parallel



Pattern for Eave Trough at any Angle.—Profile, Plan and Pattern.

to D C. Then will F E G C D B be the part plan. In this manner the miter line is obtained, no matter what angle the plan has.

For the pattern proceed as follows: Divide the profile A, including the bead, into equal spaces, as shown by the small figures 1 to 11. From these intersections, and parallel to B D in plan, drop lines, intersecting the miter line D E, as shown. Now at right angles to F E draw any line, as H I, upon which place the stretchout of the profile A, as shown by the small figures 1′ to 11′. At right angles to H I, and through these small figures, draw lines, which intersect with lines drawn at right angles to F E from intersections having similar numbers on the miter line D E. Trace a line through the points thus obtained, as shown by J. K. Then will L M J K be the desired pattern.

THE TOLEDO MACHINE & TOOL COMPANY, Toledo, Ohio, are completing a shipment of 12 carloads of Punch Presses for the equipment of a large manufacturing plant in England. The company report a heavy demand for machinery and expect a large business during the coming year.

Van Noorden Skylights.

It is a well-known fact that good light is required in buildings where paper is manufactured, and it is generally conceded that overhead daylight diffused on

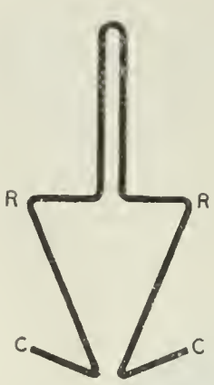


Fig. 1.—Shape of Bar as Formed in Press.

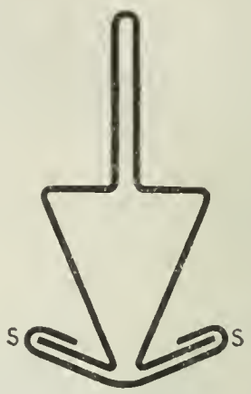


Fig. 2.—Showing Extra Strip for Clamping the Bar.

Skylights for Paper Mills.

the paper making machines below is the best for this kind of work; at least, it is considered much superior to side light admitted through windows. While the sheet metal skylights manufactured by the E. Van Noorden Company of 944 Massachusetts avenue, Boston, Mass., are especially adapted for the needs of buildings in which paper is manufactured, they will also be found

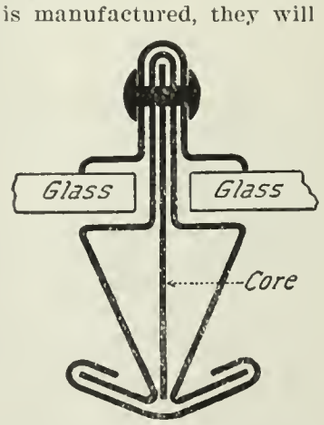


Fig. 3.—Showing the Core to Give Greater Rigidity in Case of Long Spans.

adapted to other kinds of structures. The claim is made that the Van Noorden skylight bar, being formed of a

strip of flat sheet metal, bent up by dies in a 10-foot press in the shape indicated in Fig. 1, presents a construction which permits of the water of condensation being carried off, instead of allowing it to drop down on the contents of the room in which the skylight may be placed. Referring to the engraving, C C are the condensation gutters and R R the rabbets or resting places for the glass. An extra strip, S S, is put on to clamp the bar together, as indicated in Fig. 2. When the bars stretch over a long span a sheet metal core is inserted internally, all as clearly indicated in Fig. 3 of the illustrations. This, it is claimed, adds greatly to the rigidity and strength of the bar. The glass is bedded in putty and capped with sheet metal, as shown. The bars are mounted on a base which carries a main internal gutter, and into which empty all the gutters of the bars. The water is then carried outside through holes in the double wall of the base. This system has been employed by the company with great success, and has been used in paper mills, as well as other kinds of manufactories, public buildings and residences throughout a large section of the country. The company have issued a catalogue containing 40 pages, fully illustrated, relating to their skylights, and we understand a copy will be sent free to any address on application.

FLASHINGS.

A REPORT from Blairsville, Pa., states that a site is being sought at that place for a 10-mill Tin Plate plant, of which A. E. Piper, formerly superintendent of the Star Tin mill at Pittsburgh, will be the manager.

THE NEW JERSEY ZINC COMPANY are making a number of extensions and additions to their large plant at Hazard, Pa., including an addition of 50 feet to the foundry, 96 new oxide furnaces, and a rolling mill to make Sheet Zinc; also new storage house and blacksmith shop. At present the concern are making only Bar Zinc. They employ between 300 and 400 men, but this number will shortly be largely increased.

THE six-mill plant of the American Tin Plate Company at Atlanta, Ind., is being dismantled. Three of the mills have been removed to Elwood and will be added to the company's large plant at that place.

THE HULLS KEY CAN COMPANY have been incorporated in New Jersey with a capital of $125,000 to manufacture Tin Cans, &c. The incorporators are: W. C. Stubbs, A. C. Yates, C. G. Leavenworth and P. A. Neales, Jr.

JOHN STEVENS, superintendent of the Midland plant of the American Sheet Steel Company at Muncie, Ind., has resigned in order to accept a similar position with the Inland Steel Company.

J. E. LAUCK, formerly manager of the United States works of the American Tin Plate Company at Demmler, Pa., has been appointed manager of the new works of the McKeesport Tin Plate Company at McKeesport, Pa.

THE WHEELING CORRUGATING COMPANY, Wheeling, W. Va., announce that they have removed their Philadelphia office from their old quarters to 402-406 Race street, where, owing to increased warehouse facilities, they will be enabled to carry a full and well assorted stock of all the goods of their manufacture, including Roofing Plates, Bright Tin Plates, Black and Galvanized Sheets, Steel Roofing and Siding, Eave Trough, Conductor Pipe and Fittings, Valleys and Gutters, Steel Ceilings and Side Walls, Steel Lath, Solder, Rivets, Nails and other Tinners' and Roofers' Supplies.

AUSTIN & WOODRUFF, Waterbury, Conn., have the contract for placing Metal Ceilings, &c., in a store in the Platt Building for A. W. Woolworth & Co.

THE GENERAL METAL ROLLING MACHINE & MFG. COMPANY, 26 Clinton avenue, Newark, N. J., have been incorporated with a capital of $125,000 to manufacture Metal Rolling Machines. The incorporators are: Warren Clouse, John R. Taylor and John H. Lotsch.

THE JUDGE & LELAND MFG. COMPANY of Clifton Springs, N. Y., have been incorporated with a capital of $75,000 to manufacture Tin and Sheet Iron Goods.

PETER DONLY, Bridgeton, N. J., who is engaged in the roofing business, is contemplating the erection of a factory for the manufacture of Roofing Materials. He will put in rolling machinery and make his own Felt Paper. Mr. Donly claims to make the only Paint that will stand on the tanks used in the Dupont Powder Works.

THE statement is made by workmen in Western rolling mills and steel works that if T. G. Shaffer is re-elected president of the Amalgamated Association of Iron, Steel and Tin Workers at the convention to be held at Wheeling, W. Va., next month a rival association will be organized. The proposed association will include the mills at South Chicago and Joliet, in Illinois; Milwaukee, Wis., and several others. The workmen in these mills are greatly dissatisfied at the course pursued by President Shaffer last summer in breaking the agreement made for the year, and they do not propose to belong to an organization controlled by him.

THE WATERLOO CORNICE WORKS, Waterloo, Iowa, are desirous of finding out the present whereabouts of Paul Fink, a Cornice maker, who was last heard from at Pullman, Ill., in 1901; also of R. Natre, a Cornice maker, who was working in Dayton, Ohio, last year. These men are asked to communicate with the above named concern.

The Norton Grinding Company.

The Norton Grinding Company of Worcester, Mass., are about to build a new machine shop at Barber's Crossing, for the manufacture of heavy plain grinding machines, for which the company were organized. The business is now conducted in the machine shops of the Norton Emery Wheel Company, with whom the Norton Grinding Company are intimately associated. The new grinding shop will be located near this plant, which will be 150 x 80 feet on the ground and two stories in hight. The main room in the shop will extend to the turret roof, but all around this room, at the second story, a gallery will extend in which lighter tools will be located. The shop will be equipped with every modern convenience, including electric traveling cranes, and a number of special new tools have been ordered. A spur from the Boston & Maine Railroad will provide the plant with excellent shipping facilities.

The World's Production of Spelter.

We are indebted to the American Metal Company of New York for a copy of the statement of the production of spelter in the world, compiled by Henry R. Merton & Co., Limited, metal merchants, of London. The statistics of the production of spelter for the United States were collected by the American Metal Company:

	1901. Tons.	1900. Tons.	1899. Tons.	1890. Tons.
Rhine, Belgium and Holland	199,285	186,320	189,955	137,630
Silesia	106,385	100,705	98,590	87,475
Great Britain	29,190	29,830	31,715	29,145
France and Spain	27,265	30,620	32,955	18,240
Austria and Italy	7,700	6,975	7,190	7,135
Poland	5,935	5,875	6,225	3,620
	375,760	360,325	366,630	283,245
United States of America	122,830	110,465	115,855	59,371
Totals	498,590	470,790	482,485	342,616

It will be observed that our percentage of the world's total production has risen from 17.3 per cent. in 1890 to 24.6 per cent. in 1901.

Nelson M. Beach, treasurer and general manager of the Bridgeport Brass Company, died suddenly of heart disease on March 19 at his home in Bridgeport, Conn. He was born in Derby, Conn., 48 years ago, and as a boy entered the employ of the Bridgeport Brass Company. He leaves a widow and two sons.

THE DEMING COMPANY of Salem, Ohio, manufacturers of Pumps and Hydraulic Machinery, have of late experienced such an increase in the amount of their Pump business that they have been hampered for foundry room. They are preparing plans for an addition 60 x 80 feet. Heretofore they have sent much of their heavy work to other foundries, but will now do all their own work in this line.

THE LETTER BOX.

Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

NAMES AND ADDRESSES INDISPENSABLE.

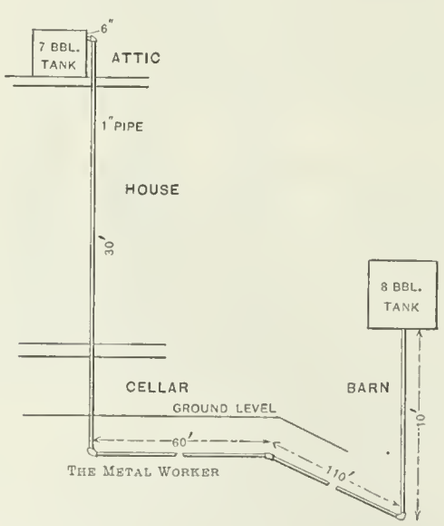
In the past we have been somewhat indulgent in presenting, at times, the inquiries of correspondents who have withheld their names and addresses. The necessity of having this information led to placing at the head of the Letter Box the request that correspondents in all cases give their names and addresses, not for publication but for our own information. This stipulation has recently been ignored by quite a number of correspondents. We are glad to accord to our readers all the assistance that may be derived through the presentation of their problems in the Letter Box, but at the same time must insist that their contributions be signed with their full name and address, which will not, of course, be printed without their consent.

At the present time we have before us a communication signed "A Constant Reader, New York," asking about skylight bars and marking ink for galvanized iron. If this correspondent will send his full name and address we will gladly present his inquiries in the Letter Box for the consideration of our readers.

From another correspondent, who signs himself "Retailer, Conn.," we have received a letter stating that the plumbing supply trade are encroaching upon the rights of the master plumbers in his section, by furnishing goods to those who are not engaged in the trade. We shall be glad to give this correspondent's views due consideration if he will comply with the conditions as given above.

ARE THE PIPES AIR BOUND?

From E. J. F., Kendall, N. Y.—I seldom ask questions of *The Metal Worker*, although I have been a subscriber to the paper for 18 years, and have always enjoyed reading it. However, I desire now to ask two questions, although the answer to one will probably



Are the Pipes Air Bound?—Fig. 1.—Showing the Piping System.

cover both. I put up a wind mill for a customer last fall and located a tank in the attic of his house, as shown by the diagram in Fig. 1. This tank is 3½ x 4 feet and 4 feet deep. I ran an overflow pipe from this tank to a tank in the barn, as shown. The water, however, does not discharge into the barn tank through the pipe for some time and not until the wind mill has pumped the tank so full that it runs over. The pipe is not stopped up, but is connected with the tank 6 inches below the top. There is at least 20 feet difference in hight between the discharge pipe at the barn and the bend where the pipe connects with the house tank. I think that air must accumulate in the horizontal pipe, but do not see how to remedy it. It is laid about 3 feet in the ground and runs 170 feet. The pipe is 1 inch in diameter, and if the water runs through it as it should it would take care of double the amount of water that the wind mill would pump. I know this, as I have arranged several tanks in a similar way which work perfectly. The foot of the pipe in the cellar is a foot lower than at the elbow where the pipe rises to the tank in the barn, and when it was laid care was taken to preserve an even pitch throughout the entire length.

In the other job that is giving trouble, shown in Fig. 2, a ½-inch telltale pipe leads from the tank down to the cellar, where it runs about 6 feet horizontally and



Fig. 2.—The Second Troublesome Piping.

then turns up through the floor to a sink, so that it can be known when the tank is full by the flow of water from the telltale pipe in the sink. Water will not run through this pipe until it has risen in the tank several inches above the outlet, although in a short time it then runs fast enough, but it does not start soon enough to warn the person in charge of the pump, and if a careful watch is not observed the tank is liable to be pumped too full.

Note.—We hope that our readers will lend their assistance to our correspondent in his difficulty. Meanwhile, we would suggest that the pitch of the outlet pipe at the tank be investigated. In some cases that have been discussed in *The Metal Worker* the outlet pipe has had a pitch upward so that the pipe was air bound at the start, and the few inches that the water rose in the tank above the outlet did not afford sufficient pressure to dislodge the air. If this is the cause of the trouble the difficulty can be overcome by using a tee instead of an elbow, and running a short pipe up above the top of the tank. If the trouble is due to the pipe in the ground becoming air bound, the immediate cause of the trouble can be removed by means of a force pump, but it will recur unless the pipe is straightened so that there will be no kinks in it where the air can lodge.

WILL METALS MELT IN BOILING WATER?

From W. H. F., Washington Depot, Conn.—Will you kindly inform me through the Letter Box if the alloy of bismuth, lead and tin, known as Rose's metal, will melt in boiling water; or if any metal, the melting point of which is below 212 degrees, will melt in water at that temperature or higher?

Answer.—There are two alloys called Rose's metal, one of which is composed of one part each of lead and tin and two parts of bismuth by weight. This melts at 201 degrees F., and will melt in water before it boils. Another alloy called by the name of Rose's metal is composed of eight parts of lead, three parts of tin and eight parts of bismuth by weight. This melts at 174 degrees F. Any alloy having a melting point at or below 212 degrees F. will melt in boiling water with the barometer at 30 inches. High altitudes make a lower degree of boiling for water; therefore, differences in barometric pressure from any cause may prevent alloys with melting points at or near 212 degrees from melting.

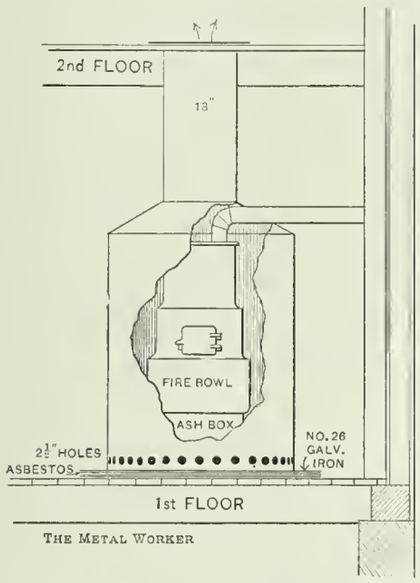
PATTERN FOR ELBOW SPRINGING FROM PIPE.

From C. L. M., Kansas City, Mo.—Will you please explain how to obtain a correct pattern for an elbow of any number of pieces springing from a vertical pipe whose diameter is greater than the diameter of the elbow?

Answer.—On page 55 of *The Metal Worker* of October 26, 1901, is shown the method of obtaining the pattern for an elbow springing from a pipe, when the elbow is placed in the center of the vertical pipe. This is exactly what our correspondent requires. Should the patterns be desired for an elbow placed at one side of the center of the vertical pipe, they can be found on page 45 in *The Metal Worker* of February 15, 1902. The principles there given can be applied to any size of pipe or elbow.

WHAT CAUSED THE FIRE?

From J. B. E., Cincinnati, Ohio.—The drawing presented herewith shows a stove having a 24-inch fire pot placed inside of a galvanized sheet iron casing 44 inches in diameter. The casing has a large door in the front so that the fire can be replenished with coal and ashes can be removed. Around the bottom of the casing there is a row of 2½-inch holes punched 2 inches apart. From the top of the casing a single pipe, 18 inches in diameter, runs up to a register face placed in the floor above,



What Caused the Fire?

which is only a register face, there being no valves connected with it. Underneath the stove, extending 6 inches all around, the floor was covered with No. 26 sheet iron under which were three layers of asbestos paper. The floor underneath was made of tongued and grooved flooring, making it perfectly air tight. From the bottom of the grate in the stove to the floor is 14 inches. There were no cracks or holes in the bottom of the stove, and there were about 2 inches of ashes in the ash box, yet under these conditions the building caught fire underneath the stove. The sheet iron was removed, which showed that the fire burned through the floor. It should be remembered that the hot air pipe from the top of the stove was 18 inches in diameter, and the register face of ample size to allow the hot air to pass through. On the inside of the casing on the floor was a small quantity of soft coal, yet this did not ignite. Can you or any of the readers of *The Metal Worker* explain why the floor caught fire? An explanation of the cause would confer a particular favor at this time.

Note.—We shall be glad if our readers will give their views on this subject. In the meantime we would remark that every necessary precaution to prevent a fire seems to have been taken. The cut shows the stove setting up on legs so that the bottom of the ash pit, even if covered with hot ashes, would hardly send down heat enough to ignite the flooring underneath so much insulating material. That some warmth might be imparted is probable. It is also possible that the frequent warming and cooling of the flooring may have been conducive to spontaneous combustion.

TO REMOVE LIME FROM LEAD PIPE.

From M. & P., Kinston, N. C.—Will you please tell us what will remove crystals from lead pipe running from urinals? There seems to be a coating of hard substance on the inside of the pipe. Is there any solution that will remove this and not hurt the pipe?

Answer.—A solution of sulphuric acid and water—four parts water and one part acid—thrown into the urinal, a little at a time, will dissolve the lime incrustation in a short time. If the lead pipe can be closed at the outlet, it can be filled with the solution for a short time with good effect. Strong lye or potash has been used for cleaning urinal pipes, and placing pieces of soap in the bowls is also useful for this purpose.

NEEDS A PRESSURE REGULATOR OR TANK.

From G. A. H., Canaseraga, N. Y.—Our water system here gives a pressure of 99 pounds. Can we reduce the pressure on hot water boilers so as to make them last longer, by keeping the faucet connecting the supply with the boiler nearly closed, or open just enough to keep up the flow?

Answer.—The adjustment of the stop cock will not have the effect of reducing the pressure. It would only adjust the supply when the faucets were open. The pressure can be reduced by means of a regulator attached to the supply pipe, either placing it in the cellar so as to reduce the pressure on the whole plumbing system, or connecting it with the supply pipe to the boiler where it connects with the boiler. These regulators are made so that they can be adjusted to any pressure desired, and they can be procured from any supply house. Another method of avoiding excessive pressure is to locate a tank at the highest part of the building, with a ball cock upon it, so that it will not overflow. Connect this tank with the boiler supply, then the boiler will only be subjected to the pressure that will be due to the hight of the tank above it.

RETINNING COPPER WARE.

From I. E. D., Atlantic, Iowa.—Having read the article on "Retinning Copper Ware" in the Letter Box of March 15, I notice that the writer does not say in what shape his bar tin is when he applies it to the article to be tinned. I have done some retinning and use about the same proportions recommended by the writer, but with this difference: I take my block tin and melt it in a ladle and pour it in a cloth, holding the four corners in my hand, then by jarring it down on the bench while it is cooling I have the metal in very fine particles, so that it can be applied with better control than by melting it off the bar on the work to be tinned.

A Novel Steam Boiler.

An English engineer, says *Popular Mechanics*, has designed a steam boiler made up mainly of coils of steel tubing. The great objection to this kind of boiler hitherto has been that the generation of steam is very irregular and the coil is liable to become choked with deposit from the water. To get rid of these disadvantages the inventor has designed a coil boiler, into which he places small balls which can move freely in the tube for a short distance. These, by checking the flow of water through the lower coils of the tube, permit the steam to come off more quietly, and the violent production of steam, so common with this type of boiler, is prevented. As the balls are in constant movement, all scale and deposit are cleared away, and the tube is thus kept much longer in working order than it otherwise would be. The boiler is intended for use in automobiles and steam launches.

TRADE REPORT.

MARKET SUMMARY.

Pig Tin is dull, with spot held at high figures.

Copper is extremely quiet and rather weaker.

Pig Lead continues dull and firm.

Spelter is quiet, but very firm in price.

Antimony shows no change.

Nickel is in good demand at former prices.

Aluminum is active and without change.

Tin Plates are quiet, with prices firm and unchanged.

Sheets continue in heavy demand, and prices are strong with upward tendency.

Scrap Iron is very active and firm.

Scrap Brass and Copper are strong and higher.

Foundry Iron is scarce and high in price.

Sheet Copper is in good demand and firm.

Sheet Zinc is unchanged.

Hardware is in excellent demand, and prices well maintained.

Nuts, Cold Punched and Hot Pressed, have been again marked up in price.

Egg Beaters have been advanced in price.

Pumps are in active demand with some uneasiness in prices.

Stove Boards are selling well with prices very strong.

Wire Nails are scarce and firm.

Cut Nails are in fair demand at former prices.

Window Glass has been advanced in price.

White Lead is firm and in better demand.

Linseed Oil is firm and unchanged.

Spirits Turpentine has advanced 3 cents a gallon.

Wrought Iron Pipe has been again advanced in price.

Galvanized Range Boilers are likely to advance in price.

METAL MARKET.

NEW YORK, March 21, 1902.

Pig Tin.—While the price of Spot Tin has been maintained, and has even been advanced since last week, these prices are purely artificial. The spot supply of Pig Tin is said to be under close control. Business throughout the week was of the very slowest nature. Consumers are still buying very sparingly. Practically nothing is doing in futures, although they are considerably below spot prices. Straits Pig, in small lots, is quoted by jobbers at 27½c to 28c. per lb.

Copper.—The market has fallen back into a dull and uninteresting condition. Everything is extremely quiet and the market is in the buyers' favor. Purchasers are not showing themselves, however, as there is a prevalent belief that prices will go lower. The larger consumers are said to be still well supplied and smaller users are buying only in a retail way, according to the dictates of their immediate requirements. Prices are largely nominal. Jobbers quote Lake Ingot in small lots at about 13¼c. to 13¾c. per lb., and Casting Copper at about 13c. to 13¼c. Exports continue on a very large scale. Thus far this month they have amounted to 12,600 tons, and it is expected that for the entire month exports will reach fully 18,000 to 20,000 tons. These heavy shipments are attributed entirely to the covering of previous sales.

John Stanton reports Copper production in the United States and United States exports as follows, in gross tons of 2240 lbs.:

	Reporting mines.	Outside sources.	Total U. S. product.	U. S. exports.
First half 1899.....	111,987	12,500	124,487	56,460
Second half 1899....	118,818	18,900	137,719	63,351
Total 1899.....	230,806	31,400	262,206	119,811
First half 1900.....	114,177	20,400	134,577	90,747
Second half 1900....	113,810	20,400	134,104	69,335
Total 1900.....	227,987	40,800	268,681	160,082
First half 1901.....	112,794	20,600	133,394	50,027
Second half 1901....	110,561	21,300	131,861	44,539
January, 1902.....	15,155	3,800	18,955	15,021
February, 1902.....	16,931	3,400	20,331	16,108

Sheet Copper.—The movement in Sheet Copper is still of good proportions, the consumptive demand being active, and the outlook favorable for a continuance of the present activity in the future. Prices are firm on the basis of 18c. per lb. from store.

Pig Lead.—No change is to be noted in the Pig Lead situation. The demand is light, and business generally very poor. Prices, however, are steady. American Pig in small lots being quoted at about 4.45c. to 4½c. per lb. St. Louis advices report a quiet but firm market, and prices without much variation.

Spelter.—Business in Spelter is said to be still rather light. The tone of the market has improved materially, however, and wholesale prices have advanced. Jobbers quote Western brands in small lots at 4.60c. to 4.70c. per lb. St. Louis advices report the market for Spelter as firm and quiet, although the volume of business has not been large. At the same time offerings are quite light.

Sheet Zinc.—A fair demand for Sheet Zinc is reported, and prices are unchanged at 6¾c. per lb. for 600-lb. cask lots, and 7c. to 7¼c. for smaller quantities.

Antimony.—This metal is without change. Hallett's is quoted at 8⅝c. to 8¾c. per lb. in small parcels; U. S. at 8⅜c. to 8½c., and Cookson's at 10¼c. to 10¾c.

Nickel.—No change has taken place in this market. Small lots are quoted at about 55c. per lb.

Aluminum.—There is no change either in price or in the volume of business, which continues good. Small lots of No. 1 Ingot guaranteed 99 per cent. pure are quoted at 37c. per lb., and 100-lb. lots at 35c.

Tin Plates.—The market is unchanged in any respect from the conditions reported for the last few weeks, and is quite devoid of interesting features. Deliveries from mills are said to be large in volume, but are almost exclusively on old contracts. Retail business has been rather quiet, owing to unfavorable weather conditions early in the week. Prices remain firm and unchanged. American Bessemer Coke Plates, IC, 14 x 20, in small lots are selling at about $4.85 to $5 per box at New York and corresponding points.

Sheets.—A large number of orders for both Black and Galvanized Sheets are still coming into the mills, which, as a rule, are filled up for the next two or three months. The heavier gauges are particularly active, and it is said that Black Sheets running from 10 to 14 gauge have been imported. The outlook favors a very heavy demand during the spring and summer months, with prospects of a sharp scarcity in the supply. It is this contingency, perhaps, which stimulates consumers in placing their orders at this time to cover future needs. Prices while very firm are no higher. Jobbers quote No. 27 one pass cold rolled Soft Steel Sheets, in small lots, delivered at New York or corresponding points, at about 3.90c. to 4c., and Galvanized Sheets at 67½ and 5 per cent. to 70 per cent. off the list.

Chicago advices are as follows: A large volume of business is reported in Galvanized Sheets, but the demand for Black Sheets is not specially heavy, although even on the latter the mills are not in any case promising earlier than three weeks' delivery. Continued scarcity is noted in 10 to 14 gauge. Jobbers quote small lots at 3.35c. to 3.45c. for No. 27 Black, and 70 and 5 for Galvanized.

Old Metals.—There is an active demand for Scrap Iron of all kinds that absorbs about all the material offered in the market and prices rule very strong. Scrap Brass and Copper, also, are active and firm. Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper.....per lb. 11¼c.
Light and Tinned Copper.....per lb. 10 c.

Heavy Brass	per lb.	8¾c.
Light Brass	per lb.	6½c.
Lead	per lb.	3¾c.
Tea Lead	per lb.	3⅝c.
Zinc	per lb.	3 c.
Pure Aluminum Sheet	per lb.	25 c.
Cast Aluminum	per lb.	20 c.
No. 1 Pewter	per lb.	15¾c.
No. 2 Pewter	per lb.	9 c.
Tin Plate Scrap, per gross ton		.... to $5.00
Wrought Iron Scrap, per gross ton		$13.50 to 14.00
Heavy Cast Scrap, per gross ton		12.50 to 13.00
Stove Plate Scrap, per gross ton		9.50 to 10.00
Burnt Iron, per gross ton		7.50 to 8.00

THE PIG IRON MARKET.

NEW YORK.—It is becoming increasingly difficult to quote the market, since everything depends upon the deliveries and the necessities of the buyer. As a rule the quantities required for urgent delivery are small, but as high as $21 and $22 has been paid at New England points. Some fair sized sales have been made for forward delivery. Some Scotch Iron has been bought for importation, but the quantity thus far is small. We quote for forward delivery, Northern Irons: No. 1, $19.25 to $19.75; No. 2 X, $18.25 to $18.75; No. 2 Plain, $17.75 to $18.25; Tennessee and Alabama brands, No. 1 Foundry, $16.75 to $17; No. 2 Foundry, $16.25 to $16.75; No. 1 Soft, $16.75 to $17; No. 2 Soft, $16.25 to $16.50; No. 3 Foundry, $15.50 to $15.75; No. 4 Foundry, $15 to $15.50.

CHICAGO.—The demand for ordinary Foundry Irons has been sharp for spot delivery and for early shipment, but business for future delivery has not been large, although good inquiries are in the market. The supply of local Iron is extremely scanty, and the large Southern companies are not willing to take more contracts at present. Prices for spot Iron run from $1 to $2 per ton above quotations made on contracts for the last half of the year. We quote as follows:

Lake Superior Charcoal	$20.50 to $21.50
Local Coke Foundry, No. 1	18.50 to 19.00
Local Coke Foundry, No. 2	18.00 to 18.50
Local Coke Foundry, No. 3	17.50 to 18.00
Local Scotch, No. 1	19.00 to 19.50
Ohio Strong Softeners, No. 1	19.60 to 20.00
Southern Silvery, according to Silicon	16.90 to 17.15
Southern Coke, No. 1	16.40 to 16.65
Southern Coke, No. 2	15.65 to 15.90
Southern Coke, No. 3	15.15 to 15.40
Southern Coke, No. 1 Soft	16.40 to 16.65
Southern Coke, No. 2 Soft	15.65 to 15.90

PHILADELPHIA.—It is impossible at the present time to quote Pig Iron with any degree of accuracy. Quotations given by leading houses show as much as $4 per ton difference in prices for the same grades of Iron. For example, if there is no spot Iron to be had at less than, say, $19 to $20 for No. 2 X Foundry, consumers have no alternative but to pay the price or go without the Iron. Orders for the same grade of Iron can also be placed at $16.50 to $17, but no deliveries are promised inside of six months, and not guaranteed even then; so it is a question whether it is better to pay $20 for something that can be had at once, and so tide over an emergency, or to contract at $3 or $4 less for deliveries at a time when conditions may be entirely different to what they are at the present time. These are the present problems which the trade are trying to solve. So far as immediate relief to the market is concerned prospects are not better than they were a week ago. Higher prices are mentioned for March and April shipment, but the extreme range will be about as follows for city and nearby deliveries:

	Deliveries to July.	Delivery July to December.
No. 1 X, Foundry	$19.25 to $20.00	$18.50 to $19.00
No. 2 X, Foundry	18.75 to 19.50	17.00 to 17.50
No. 2, Plain	18.25 to 18.50	16.50 to 17.00

PITTSBURGH.—The present condition of the Pig Iron market is without parallel in the history of the Iron trade. It is really not a question of price in the Pig Iron market any longer, but where to get the metal. Iron for delivery this side of October has been pretty well cleaned up, and for any stray lots that can be had sellers can get almost any price they ask. No. 2 Foundry Iron has sold up to $20 a ton, Pittsburgh, for prompt delivery. The market is in such shape that it is practically impossible to quote prices.

CINCINNATI.—The Pig Iron market is still quiet, but by no means dull. One of the main reasons why Iron is not selling more freely is because furnaces are either already sold out or prefer to withhold their output for late delivery until they see where they land in regard to prices and stock to offer later in the year. The price of the leading Southern interests is nominally unchanged, yet in the face of this it is a known fact that No. 2 Foundry is selling from outside furnaces as high as $13, Birmingham basis, and for delivery prior to August premium of even 50c. over that figure is offered. There is a strong undertone to the quotation list, and it is very hard to see how the minimum price of $12.50, Birmingham, for No. 2 can be much longer maintained even nominally, as a good portion of the actual selling is being done considerably above that figure. There is a determined effort being made to raise selling prices, and in this sellers claim the support of the buyers to a very large degree. We quote f. o. b. Cincinnati:

Southern Coke, No. 1	$15.25 to $16.25
Southern Coke, No. 2	14.75 to 15.75
Southern Coke, No. 3	14.25 to 15.25
Southern Coke, No. 4	13.75 to 14.75
Southern Coke, No. 1 Soft	15.25 to 16.25
Southern Coke, No. 2 Soft	14.75 to 15.75
Southern Coke, Gray Forge	13.75 to 14.75
Southern Coke, Mottled	13.75 to 14.75
Ohio Silvery, No. 1	18.25 to 18.50
Ohio Silvery, No. 2	17.75 to 18.00
Lake Superior Coke, No. 1	18.35 to 18.60
Lake Superior Coke, No. 2	17.85 to 18.10
Lake Superior Coke, No. 3	17.35 to 17.85

ST. LOUIS.—The volume of inquiry and sales has slackened considerably, but the tone of the market is very firm and the amount of material available for immediate shipment is extremely light. Owing to this fact a wider range of prices prevails, and advances of 50 cents, and sometimes more, for small lots, above our quoted prices are not uncommon. Owing to the improvement in weather conditions shipments are moving in a more satisfactory way and work of production is also showing improvemement. We quote for cash, f. o. b. St. Louis, as follows:

Southern, No. 1 Foundry	$16.00 to $16.50
Southern, No. 2 Foundry	15.25 to 15.75
Southern, No. 3 Foundry	14.75 to 15.25
Southern, No. 4 Foundry	14.25 to 14.75
No. 1 Soft	15.75 to 16.25
No. 2 Soft	15.25 to 15.75

CHICAGO REPORT.

Scrap Iron and Steel.—The demand is very good, and prices are strong. We quote dealers' buying prices for carloads lots, Chicago delivery, as follows:

	Per net ton.
Country Wrought Scrap	$14.00 to $14.50
Machinery Cast	13.00 to 13.50
Malleable Cast	12.00 to 12.50
Stove Plate (free from burnt)	10.00 to 10.50
Burnt Iron and Grate Bars	8.00 to 8.50
Sheet Iron and Hoops	8.00 to 8.50
Plow Steel	11.50 to 12.00
Breaking Stock	.... to 11.00
Old Boilers—whole (Iron)	9.50 to 10.00
Old Boilers (Iron) cut in single Sheets and Rings	12.00 to 12.50
Old Gas Pipes and Boiler Tubes	12.00 to 12.50
Cast Borings	7.00 to 7.50
Turnings	11.50 to 12.00
Horseshoes	14.00 to 14.50

Old Metals.—Consumers are buying liberally. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	11 c.
Copper Bottoms	10½c.
Copper Clips	11 c.
Red Brass	12 c.
Yellow Brass	8 c.
Red Brass Borings	9 c.
Yellow Brass Borings	7¼c.
Light Brass	7 c.
Pipe Lead	3.87½c.
Tea Lead	3.35c.
Zinc	3.10c.
Tin Foil	19 c.
Pewter, No. 1	16 c.
Pewter, No. 2	10 c.
Aluminum	20 c.

Old Rubber.—Business is quiet. Dealers' buying prices are as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	42.50	.....
Rubber Shoes	....	6¾c.
Rubber Car Springs	....	5 c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6½c.
Black Rubber	....	4 c.
White Rubber	....	8¼c.

Rags.—The stocks are so large that another decline is expected. Dealers quote buying prices of good Country Mixed Rags, Chicago delivery, at 70 to 75c. per 100 lbs. in any quantity.

Anthracite Coal.—The demand is light. Dealers are waiting for an announcement of a reduction in prices. Prices are as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis.	5.75	6.00
St. Louis.	6.20	6.45
Kansas City, Mo.	8.25	8.50

THE HARDWARE TRADE.

The trade is gradually recovering from the effects of the interruption of business caused by the recent severe weather, and especially the freshets, which interfered somewhat with the operation of mills and factories, already overtaxed, to meet the demands of the trade. There has, however, been a very satisfactory return to the volume of business, which is at least normal, and the production of goods which is going on in nearly all lines makes the record. The orders coming in to the manufacturers in all lines indicate a healthy condition of business throughout the country. The bulk of the orders from the large houses have already been placed, but some supplementary ones are being received, together with many from the smaller jobbers and larger retailers. The volume of new business is thus considerable, and with the orders in hand the manufacturers have enough in sight to keep them occupied for several months. In many lines the difficulty is to get goods. The scarcity of raw material is a troublesome matter, interfering with the output of the factories. The tone of the market is decidedly firm. A number of minor advances are reported, and in products which lie near the raw material the market is especially strong with an upward tendency. The reports in regard to building throughout the country are very encouraging and the indications point to an active demand for Hardware in these lines. The financial condition through the trade is eminently satisfactory and there is comparatively little complaint in regard to collections. The enterprise of the country continues to show itself in many ways and the prospect for a large business is excellent.

NOTES ON PRICES.

Wrought Iron Pipe.—The National Tube Company have adopted new base discounts on Wrought Iron Pipe and on Wrought Steel Pipe. The new discounts are placed on the goods f.o.b. cars Pittsburgh, Pa., and are as follows:

⅛ to ½ inch Black Pipe, 60 per cent.
⅛ to ½ inch Galvanized Pipe, 48 per cent.
¾ to 12 inch Black Pipe, 67 per cent.
¾ to 12 inch Galvanized Pipe, 55 per cent.

The difference between the jobbing point and shipping base discount has remained unchanged. The base discounts in the Metropolitan district are 1 3-10 on the gross higher than Pittsburgh prices. The National Tube Company are giving their preferred customers an additional discount of two fives on the base, and all other customers are receiving an extra 5 per cent. on the base. The preferred customers purchase their Pipe in flat cars; that is to say, that one car contains but one size of Pipe alone, and cars containing mixed sizes are, as a rule, diverted to the preferred customers. In this manner the mills can ship the goods at a lesser expense, and preferred customers get the benefit of the mixed car trade. The new prices show that Wrought Iron Pipe has advanced within the past month about 12½ per cent. This last advance, it is said, will not last very long, but is likely to be superseded as soon as the spring trade opens by still higher quotations.

Fresh Air Inlets.—Owing to the fact that the Master Plumbers' Association of Brooklyn, N. Y., succeeded in having the enactment concerning ventilation and backairing in the Borough of Brooklyn changed, so as to permit ventilating devices of more than one maker to be used, the Hart-Ayres Plumbing Company have announced the following change in price of the Ayres Fresh Air Inlet: 4-inch is now $6.50 net, and 6-inch is now $11.50 net. We understand that this concern are also putting another Inlet on the market in competition with the Ayres Fresh Air Inlet, thus complying with the law and at the same time controlling the business of Fresh Air Inlets in the Borough of Brooklyn.

Galvanized Boilers.—The manufacturers of Galvanized Range Boilers will hold a meeting on March 25 and new prices will probably be announced. It is understood that an arrangement has been reached with the Brooklyn Range Boiler Company and that negotiations are pending with the Pennsylvania Range Boiler Company, which will result in an amicable settlement of the differences which have kept the market cut up for some time past. It is stated from an authoritative source that a patented Range Boiler which was put upon the market about a year ago has proved to be a failure, and that the company manufacturing it are now entirely out of the race; consequently no further trouble is anticipated from this quarter.

Sanitary Earthen Ware.—The prices made by the Sanitary Potters' Association, which went into effect March 1, are being adhered to. They will be operative until March 1, 1903, until which time no change from the present quotations on Sanitary Earthen Ware is likely to take place.

Nuts.—A further advance was made by the manufacturers on the 18th inst. in the prices of Cold Punched and Hot Pressed Nuts. This advance has been made on account of the advance in the price of Iron. The manufacturers are also filled up with orders.

Egg Beaters.—The manufacturers of Dover Egg Beaters, who are working together with a good degree of harmony, have made another advance in prices.

Pumps.—There is a good deal of unevenness in the market for Pumps, and low prices are current on Pitcher Spouts. There is, however, an excellent demand, and several of the manufacturers are considerably behind their orders.

Stove Boards.—The prices which are ruling for Stove Boards are somewhat higher than were current a year ago. The volume of business which is being booked by the manufacturers is large, and the indications are that the supply will be fully taken up by the trade.

Set and Cap Screws, &c.—This line of goods is characterized by a firm tone, and the recently advanced prices are well maintained. The large business which the manufacturers are doing indicates the activity which prevails throughout the trade.

Wire Nails.—It will take some time for the mills that were flooded to catch up with their orders for Wire Nails. The majority of the mills are behind on their orders, and shipments are further delayed by scarcity of cars. The demand for Nails in the New York market is not quite as large as was anticipated by jobbers. Stocks are broken in assortment to some extent, owing to delayed shipments from the mills. The market is firm at $2.25 to $2.30 per keg for small lots from store.

Cut Nails.—Difficulty is experienced in obtaining Cut Nails, especially Steel Nails, on account of the high price and scarcity of Steel. Some of the Cut Nails on the market are made of Scrap Iron. New York orders for Cut Nails are about of the usual proportions to Wire Nails. Small lots from store are selling at $2.25 per keg.

Window Glass.—At a meeting of the Eastern section of the National Jobbers' Association, held on March 18, the price of small lots of Window Glass, single and double strength, from store was advanced from 90 and 10 to 90 and 5 per cent. discount. The demand for Window Glass is light at the present time.

White Lead.—An improvement was noted in the demand for White Lead in Oil during the week for immediate and April delivery. Quotations are without change at 6½ cents per pound for lots of less than 500 pounds, and 6¾ cents for small quantities.

Linseed Oil.—Owing to a slight show of weakness in Linseed Oil prices considerable Oil was sold early in the week at a shade under quoted prices. It is understood that most of this Oil was purchased for immediate consumption. The tone of the market is again firm, City Raw in small lots being quoted at about 64 to 64½ cents per gallon, and out of town Raw at 63 cents.

Spirits Turpentine.—On account of light receipts of Turpentine at Southern points and severe weather in the Turpentine district prices have advanced at this point about 3 cents per gallon. Under these conditions the demand is light. Small lots of Turpentine are now quoted at 49 to 49½ cents per gallon.

TRADE NOTES.

The American Brass Novelty Company of Grand Haven, Mich., are about to put up a factory building to cost $10,000.

The National Enameling & Stamping Company are erecting a new foundry in connection with their plant in St. Louis, Mo.

The Sharon Brass Company have been organized at Sharon, Pa., with a capital stock of $50,000, with M. O. Shrock as president and J. L. Merritt of Greenville, S. C., as secretary. R. A. Wilson and T. L. Woodward, Pittsburgh, with the above named officers, form the Board of Directors. The company will erect a plant on Ellsworth avenue, Sharon.

The American Standard Company of Washington, D. C., have been incorporated in Delaware, with a capital of $100,000, to manufacture Paints and Oils.

Kramer Brothers, Dayton Stove Repair Works, Dayton, Ohio, have just brought out a line of Cement Tampers, Jointers, Edgers, and other tools especially devised for cement and concrete work. These tools are of the latest improved patterns and are made of the highest grade material in a substantial manner. A large line of Cast Iron Lawn Flower Vases, ranging in size from the smallest to the largest made, new in design and all from new patterns, has also been added to their productions.

The Birmingham Brass Company of Shelton, Conn., one of the oldest concerns in the Brass business, are about to dissolve. The company were organized in 1866 at Ansonia, Conn., under the name of the Osborne & Cheeseman Company, with a capital stock of $120,000. About 20 years later they moved to Shelton and reorganized under the name of the Birmingham Brass Company. The company's plant includes a rolling mill and a manufacturing department in which a large line of small Brass Ware is made.

Protection from Lightning.

In discussing the question of protection from lightning, Killingworth Hedges compares European and American practice, and refers to his rearrangement of the system used at St. Paul's Cathedral, where the conductors, erected as recently as 1872, were found to be totally inefficient, both as regards the conductivity of the joints and the resistance of the earth connections. In the plan recommended, both for this installation and for the more recent one at Westminster Abbey, the number of ordinary conductors from air to earth had been greatly increased, and, besides these, horizontal cables had been run on the ridges of the roofs and in other prominent positions, so as to encircle the building, being interconnected to the vertical conductors wherever they crossed one another.

The horizontal cables were furnished at intervals with aigrettes, or spikes, invisible from the ground level, which were designed to give many points of discharge. At the same time they, in conjunction with the cables, would receive any side flash which might occur should any portion of the building receive direct stroke of lightning. The unreliability of soldered joints for conductors, whether of cable or tape, had led Mr. Hedges to design a special joint box. A special form of tubular earth has also been designed, which takes up little space, and has the advantage that if a suitable moist ground is not obtainable the desired low electrical resistance can be attained by leading a tube in connection with the rain water pipes, so that a portion of the rainfall is diverted to the tubular earth.

The author alluded to the immense amount of damage to property annually occurring which might be prevented if efficient conductors were installed. He mentioned that instead of every church having its lightning conductor, not 10 per cent. were so provided; and in the case of other public buildings the percentage was not much larger, the reason in the case of the former class of buildings being that a vicar wishing to safeguard his church had usually to pay the cost out of his own pocket.

Architects as a rule treated the question of lightning conductors in a very brief manner, and in their specifications seldom said anything as to the way in which they were to be run, or the necessity for good joints and good earth connections.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED MARCH 21, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots ₩ lb. 37¢
100-lb lots ₩ lb. 35¢
Aluminum sheet, B. & S. gauge.
In lots of 50 lbs or more.

	6-in	14-in.	24-in.
Wider than		14-in	24-in.	30-in.
And including	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19	$0.42	$0.44	$0.47
" 20	.44	.46	.49
" 21 to 23	.46	.48	.51
" 24	.46	.50	.53
" 25	.47	.51	.54
" 26	.47	.54	.59
" 27	.48	.57	.62
" 28	.48	.57	.64
" 29	.49	.60	.69
" 30	.50	.64	.77

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra

Antimony—

Cookson ₩ lb. 10½@10¾¢
Hallett's ₩ lb. 8¾@8¾¢
U.S. ₩ lb 8½@8½¢

Brass, Roll and Sheet 30%

Conductors—
Corrugated.
Round or Square.—

Galvanized ½ or more, N'st'd 70&5%
" Not Nested 70&2½%
" Plain Round, ½ or more, Nested 70&5%
Galvanized, Plain Round, Not Nested 70&2½%

Spiral Riveted.

Galvanized 40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—
See *Strainers, Conductor*

Copper—

Lake Ingot 13¾@13¾¢
Casting 13 @13¾¢
Sheet and Bolt 18¢ ₩ lb basis
Cold Rolled Sheets 19¢ ₩ lb basis
Cold Rolled and Polished Sheets 20¢ basis
Planished Sheets 21¢ basis
Bottoms, Pits and Flats ₩ lb 22¢ basis

Eave Trough Galvanized

Territory	L. C. L.
Eastern	75&10%
Central	75&7½%
Southern	70&12½%
S. Western	70&10%

Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint list, 25%

Elbows—Plain Adjustable—
Eastern List.

Tin 30%
Galvanized 30%
Perfect Elbows 40%

Stove Pipe—

Four-Piece

	4	4½	5	5½	6-inch.
No. 1.	$0.80	.85	.90	1.00	1.05 per doz.
No. 2.	.65	.70	.75	.80	.85 "
No. 3.	.60	.63	.65	.76	.80 "

Elbows and Shoes—

Galvanized 60%

Gasoline—
See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, C. R., Soft Steel.	R. G. Cleaned.
Nos. 14 to 16	₩ lb. 3.60	3.65¢
Nos. 18 to 21	₩ lb. 3.70	3.75¢
Nos. 22 to 24	₩ lb. 3.80	3.85¢
Nos. 25 and 26	₩ lb. 3.90	3.95¢
No. 27	₩ lb. 4.00	4.05¢
No. 28	₩ lb. 4.10	4.15¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₩ lb 11@14 ¢
Do. Stained 6@10½¢
Patent Planished. ₩ lb A, 11¢; B, 10¢ net

Galvanized.

Nos. 10 to 16 ₩ lb, 12¢
Nos. 17 to 21 ₩ lb, 13¢
Nos. 22 to 24 ₩ lb, 14¢
Nos. 25 to 26 ₩ lb, 15¢
No. 27 ₩ lb, 16¢
No. 28 ₩ lb, 17¢
No. 29 ₩ lb, 19¢
No. 30 ₩ lb, 21¢
} 67½&5&70% off
36 in. 1¢ ₩ lb higher.

Lead—

American Pig 4.45@4½¢
Bar 5@5½¢
Pipe 6½¢ 2½% off
Tin Lined Pipe 12½¢ 20% off
Block Tin Pipe 35 ¢ 20% off
Sheet Lead 7½¢ 20% off
Old Lead in exchange, 3½¢ ₩ lb.

Mitres Eave Trough—
See *Eave Trough Mitres.*

Nickel—

Per lb 55@60¢

Paints, Oils, &c.—
Leads—

Lead, American White, in Oil:
Lots of 500 lb or over 6½ @ 6½
Lots less than 500 lb 6½ @ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price @ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price @ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price @ 1½
Lead, White, Dry in bbls 5¾ @ 6
Lead, Red, bbls., ½ bbls. and kegs:
Lots 500 lb or over @ 6
Lots less than 500 lb @ 6½

Oils—

Linseed, City, raw ₩ gal. 64¢
Linseed, City, boiled 66¢
Linseed State and West'n, raw 63¢

Spirits Turpentine—

In Southern bbls 49 @49½¢
In machine bbls 50 @50½¢

Putty—

In bulk $1.25
In bladders 2.25
In cans 12 lb to 25 lb 2.25
In cans 1 lb to 5 lb 3.25

Petroleum Products—
In Barrels (Barrel Included)

Stove Gasoline ₩ gal. 11½@11¢
Kerosene ₩ gal. 12@13¢

Pipe, Drain 40%

Pipe, Spiral—
See *Conductors.*

Registers—
List Sept. 2, 1901.

Black Japanned 60&10@60&10&5%
White Japanned 60&10@60&10&5%
Nickel Plated 60&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze 60&10@60&10&5%
Electroplated in Brass, Bronze or Copper 60&10@60&10&5%
White Porcelain 66⅔
Solid Brass and Bronze Metal 50%

Roofing Material—

1 Ply Tarred Paper ₩ ton $30.60@31.06
2 Ply Tarred Paper ₩ roll, 108 sq. ft. 50@55¢
3 Ply Tarred Paper ₩ roll, 108 sq. ft. 70@75¢
Slater's Felt roll 500 sq. ft., 50@60¢
Roofing Pitch ₩ bbl. $2 38

Rosin—

Common and Good—Strained.

Rosin, C. & D. ₩ bbl. $1.55 @$1.60
Rosin, E. & F. ₩ bbl. 1.60 @ 1.65
Rosin, G. & H ₩ bbl. 1.70 @ 1.75
Rosin, I. & K ₩ bbl. 1.95 @ 2.60
Rosin, M. & N. ₩ bbl. 3.00 @ 3.60

Shoes and Elbows—
See *Elbows and Shoes.*

Slate Roofing—
f. o. b. cars, Quarry Station.

	According to size.
Pennsylvania:	
Best Bangor, ₩ sqr	$3.25@$4.50
No. 1 Bangor Ribbon, ₩ sq	3.00@ 3.50
Pen Argyle, ₩ sqr	3.00@ 3.75
Peach Bottom, ₩ sqr	4.85@ 5.60
No. 1 Boys, ₩ sqr	3.35@ 3.55
No. 1 Chapman Keystone, ₩ sqr	3.25@ 4.25
Vermont:	
Sea Green, ₩ sqr	$2.00@$3.25
Purple, ₩ sqr	3.75@ 4.25
Unfading Green, ₩ sqr	3.25@ 4.50
Red, ₩ sqr	7.00@11.00
Maine:	
Brownville, Unfading Black, No. 1 quality	$5.25@7.50
No. 2 quality	$4.25@6.00

Solder—

½&½ guaranteed 17½@18¢
No. 1 15@16½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	Per Pound.—Barrels	Smaller Q'ntities
Concentrated Flux	4c	5c
Eureka Flux:		
Triple Strength	3c	3½c
Extra Concentrated	4½c	5c
Crystal	..	7c
Gedney's Fluid	2c	2c
Lennox Fluid	2c	3c
Perfection Flux	3c	3½@4c
Yager's Salts, 1 lb. bottles		each, 50¢
5 lb. bottles, per lb., 45¢		

Soldering Coppers—
Per lb 20@22¢

Spelter—
Western Spelter 4.60@4.70¢

Spiral Pipe—
See *Conductors.*

Stove Pipe Elbows—
See *Elbows, Stove Pipe.*

Stove Trucks—
See *Trucks, Stove.*

Strainers, Conductor—

Galvanized 50%

Tin Pigs and Bars—

Banca, pigs ₩ lb 27½@28 ¢
Straits, pigs ₩ lb 27½@28 ¢
Straits, in bars ₩ lb 28½@29 ¢

Tin Plates, American Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:
IC. 14 x 20 $7.50
IX. 14 x 20 9.00
IXX. 14 x 20 10.25
IXXX. 14 x 20 11.50
IXXXX. 14 x 20 12.75

Melyn Grade:
IC. 14 x 20 7.00
IX 14 x 20 8.50
IXX. 14 x 20 9.75
IXXX. 14 x 20 11.00
IXXXX 14 x 20 12.25

Allaway Grade:
IC. 14 x 20 6.50
IX. 14 x 20 7.60
IXX. 14 x 20 8.70
IXXX. 14 x 20 9.80
IXXXX. 14 x 20. 10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight
" " IC, 14 x 20 $4.90@5.00
" " IX, 14 x 20 $6.00

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb 15¢
95 lb 20¢
90 lb 25¢
85 lb 30¢

Terne Plates—

N. B.—The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance for 8 to 10 lb coating and $2.50 to $3 advance for 15 lb and upward.

About 40 lb coating $16.00@16.50
About 30 lb coating 15.25@15.75
About 20 lb coating 13.25@13.75
About 15 lb coating 11.25@11.75
About 8 lb coating @10.00

Boiler Plates, American—

IXX, 14 x 26 (112 sheets) $12.50
IXX, 14 x 28 (112 sheets) 13.50
IXX, 14 x 31 (112 sheets) 15.00

Troughs, Eave—
See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz $15.00
Steel Lock Frame, per doz 18.00
Daisy Improved pattern, ₩ doz 18.00

Tubes and Tubing—

Brazed Brass, List June 6, 1898 40%
Copper and Bronze, 3c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb. 6 1899
Tin 50%
Galvanized 50%
Fittings for do 40%

Zinc—

600 lb casks ₩ lb 6¾¢
Per lb 7¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
30 gal. 70&10%
35 and 40 gal. 70%
Other sizes up to 52 gal. 60@60&10%
52 gal. and above 60%
Extra Heavy Boilers:
18 to 52 gal. 60%
53 gal. and above 55%

Brass Work, Plumbers'—
List of December 7, 1896.

Compression:
Basin Cocks 65%
Bath Cocks and Double Bath Cocks 65%
Bibs 65%
Bibs, Flanged 65%
Fuller:
Bibs 70%
Basin Cocks, Nos. 1 to 4 70%
Bath Cocks, No. 4½ $2.40 each net
Ground Key Work:
Finished Bibs 55&5%
Rough Bibs 70%
Rough Stop and Stop and Waste Cocks 70@70&5%
Rough Stop and Stop and Waste Cocks, Patented 65@65&5%

Miscellaneous—

Basin Clamps 60@65%
Basin Plugs 60@65%
Chain Stays 60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face ₩ set	$6.95	$1.05
Ground Face ₩ set	$1.00	$1.10

Sink or Bath and Wash Tray Plugs 60@65%
Soldering Nipples 70&5@75%
Soldering Unions 70&5@75%
Union Elbows, Hot Water Heating 75@75&15%

Cocks, Valves, &c.—
Cocks
Brass—

Air and Radiator Air 75@75&5%
Gas Meter and Union Meter 65@70%
Steam 65@70%

Iron—

All Iron 70@70&10%
Iron with Brass Plugs 65@70%

Valves—
Brass—

Check 65@70%
Garden Hose 65&10@70%
Gate 65@65&10%
Globe and Angle, hose outlet 65@65&10%
Globe, Angle and Cross 65&10@70&5%
Horizontal, Vertical and Angle Check 65@65&10%
Hot Water Radiator 75%
Radiator 70&10%
Safety 65%
Safety, Low Pressure 65%
Jenkins' Disc:
Check 65%
Gate 65%
Globe, Angle and Cross 70%
Radiator 80%
Radialor, Corner 75%
Safety 65%

Iron—

Iron Body 70@70&5%
Foot 65@70%
Jenkins Bros.':
All Iron, except Gate 40&5%
All Iron Gate 35@40%
Iron Body, except Gate 60%
Iron Body Gate 50@50&5%
Swing Check 50%

Earthenware—

Brown Glazed Wash Tubs 20%
Brown Glazed Sinks, Kitchen and Pantry 20%
Basins, Urinals and Hoppers 45%
Closet Bowls, Sundries, Washouts and Pedestals 50%

Fittings—
Brass Fittings—

Finished 70@75%
Rough 70@75%
Bushings 70@75%
Nipples 70@70&2½%
Unions, Rough and Finished 70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard sizes 65@70%
Cast Iron Bushings and Plugs 65@70%
Cast Iron Flanges 65@70%
Cast Iron Floor Flanges 65@70%
Malleable Iron Fittings (from ₩ list) 50%
" " Bushings 65@70%
" " Unions 65@70%
" " Unions, Flange 60&10@70%
" " Pipe Hangers, Universal 50%
Wrought Iron Nipples 65@70%
" " Couplings 60@65%
" " Long Screws 60@65%

Lavatories—

Porcelain Enameled Iron 30@30&10%

Oakum—

Plumbers' Oakum, 50 lb. bales ₩ lb 2½¢

Pipe—
Brass, Iron Pipe Size—

⅛	¼	½	¾ to 3 inch
$0.38	.34	.29	.23 ₩ lb

Cast Iron Soil—
List Feb. 25, 1901.
2 to 6 inch inclusive.

Standard 50&10%
Extra Heavy 65%
All Fittings 70%

Wrought Iron—
List Feb. 15, 1900.

	Black.	Galv.
⅛ to ⅛ inch	55%	41%
¼ to 12 inch	65%	50%

Radiators—
Standard List.

Steam 50&2½%
Hot Water 50%

Sinks, Etc.— Cast Iron—

	Black.	Galv.
Sinks, Square, Half Round and Corner	60@65%	60@65%
Sink Legs	60%	60@65%
Sink Backs	60%	60@65%
Boiler Stands, Cast Iron	60@60&10%	
Cesspools, Cast Iron	60%	

Wrought Steel Sinks—

New Era, Galv'd and Enameled 70&5%
New Era, Painted 50&10%
L. & G. 50%

Traps—

Drawn Lead Traps, List June 3, 1901 50&5%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns, Guaranteed 45@50%
All Special Patterns 25%
Non-Guaranteed Brands, complete line 45@50%
Solid Copper, list of Feb. 1, 1899 40%
Solid Porcelain—Class A, 30%; B, 40%; C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899 50@55%

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Troy Nickel Works, Troy, N. Y.

Die Stocks.
Curtis & Curtis Co., Bridgeport, Ct.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y
Toledo Mach. & Tool Co., Toledo, O.

Dryers.
Sommer's, John Son, Newark, N. J.

Dumb Waiters.
Energy Elevator Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill.
Elier, J. H. & Co., Canton, O.
Reeves Mfg. Co., Canal Dover, O.

Eave Trough Hangers.
Berger Bros. Co., Phila., Pa.
Berger Mfg. Co., Canton, O.

Elbows, Stove Pipe.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Shepard, Sidney & Co., Buffalo, N. Y.

Electric Dynamo Machines.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. Twenty-fifth St., New York.

Emery Wheels.
Scranton Corundum & Emery Wheel Co., Scranton, Pa.

Enamel, Aluminum.
Nickel Plate Stove Polish Co., Chicago, Ill.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Exhausters.
American Blower Co., Detroit, Mich.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Fire Pots.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Detroit, Mich.

Fire Sets.
Shields, W. H. & Co., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Furnace Cement.
Perkins, J. L. & Co. Chicago.
Rutland Fire Clay Co., Rutland, Vt.

Furnace Pipe and Fittings.
International Heater Co., Utica, N. Y.
Osborn, J. M. & L. A., Cleveland, O.

Furnaces and Heaters.
Akron Furnace Co., Akron, O.
Amer. Furnace Co., St. Louis, Mo.
Barstow Stove Co., Providence, R. I.
Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bonnot Co., Canton, O.
Brand Stove Co., Milwaukee, Wis.
Brien Heater Co., Hoosick Falls, N. Y.
Oory, Uzal & Co. 210 Water St., N. Y.
Digaton Furnace Co., Taunton, Mass.
Floyd, Wells & Co., Royersford, Pa.
Graff Furnace Co., 208 Water Street, New York.
Hart & Crouse Co., Utica, N. Y.
Hess-Snyder Company, Massillon, Ohio.
International Heater Co., Utica, N. Y.
Kelsey Heating Co., Syracuse, N. Y.
Lennox Manufacturing Co., Marshalltown, Iowa.
Magee Furnace Co., Boston, Mass.
Moncrief Furnace & Fdry Co., Atlanta, Ga.
Mueller, L. J. Furnace Co., Milwaukee, Wis.
Patric Furnace Co., Springfield, O.
Peck Williamson Co., Cincinnati, O.
Richmond Stove Co., Norwich, Conn.
Robinson Furnace Co., Chicago, Ill.
Schill Bros, Co., Crestline, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Ct.
Stanton Heater Co., Martins Ferry, O.
Tubular Heating and Ventilating Co., Phila., Pa.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Granite Steel Ware.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Groovers.
Wheeler, W. A., Indianapolis, Ind

Gutter Formers.
Double Truss Cornice Brake Co., Buffalo, N. Y.

Heaters, Steam and Hot Water.
American Radiator Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Dighton Furnace Co., Taunton, Mass.
Drake, W. H., Newark, N. J.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
International Heater Co., Utica, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Magee Furnace Co., Boston, Mass.
Mueller, L. J. Furnace Co., Milwaukee, Wis.
National Pipe Bending Co., New Haven, Conn.
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Smith, H. B. Co., Westfield, Mass.
Smith & Anthony Co., Boston, Mass.
Smith & Thayer Co., Boston, Mass.
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Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
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Iron and Steel, Sheet. (*See Sheets, Iron and Steel.*)

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Amer. Sheet Steel Co., New York.

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Schratwiesers Metal Lath Works.

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Colwell Lead Co., 63 Centre St., N. Y.

Lead Washers.
Littleford Bros., Cincinnati, O.

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Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

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Seavey Mfg. Co., Boston, Mass.

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Munsell, Eugene & Co., 218 Water St., New York.
Ohio Mica Co., Canton, Ohio.
Palermo Mica Co., 115 Beekman St., N. Y.
Rutland Fire Clay Co., Rutland, Vt.

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National Enameling & Stamping Co., 78 Beekman St., N. Y.

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Zucker & Levett & Loeb Co., 526-530 W. Twenty-fifth St., New York.

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Howson & Howson, Philadelphia, Pa.
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Troy Nickel Works, Troy, N. Y

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Independent Register Co., Cleveland Ohio.
Seavey Mfg. Co., Boston, Mass

Registers, Hot Air.
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Asphalt Ready Roofing Co., 136 Wate St., N. Y.
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Am. Galvanizing Wks., Chicago, Ill.

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Double Truss Cornice Brake Co., Buffalo, N. Y
Excelsior Tool & Mch. Works, St. Louis, Mo.
Keene Geo. C. & Co., Cincinnati, O.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
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American Sheet Steel Co., New York.
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McClure & Co., Pittsburgh, Pa.
Oshorn, J. M. & L. A., Cleveland, O.
Wood Alan Co., Philadelphia, Pa.

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American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Oshorn, J. M. & L. A., Cleveland, O.
Wood Co., Alan, Philadelphia, Pa.

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Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.
Penn Metal Ceiling & Rfg. Co., Phila., Pa.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Siding. *(See Roofing and Siding.)*

Sinks.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.

Skylights.
Canton Steel Roofing Co., Canton, O.
Drouve, G. Co., Bridgeport, Conn.
Mullins, W. H., Salem, O.
Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 279 Pearl St., N. Y.

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Gunster & Forsyth, Scranton, Pa.

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Clason Arch. Metal Works, Providence, R. I.

Solder.
Bruce & Cook, 186 to 190 Water St., NY
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Walworth Mfg. Co., Boston, Mass.

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Schwerdtle Stamp Co., Bridgeport, Ct.

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Dixon, Jos. Crucible Co., Jersey City, N. J.
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Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
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Williams Stove Lining Co., Taunton, Mass

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Troy Nickel Works, Troy, N. Y.

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Joliet Stove Works, Joliet, Ill.
Magee Furnace Co., Boston, Mass.
Miller, Wm. Range & Furnace Co., Cincinnati, O.
Ohio Stove Co., Portsmouth, O.
Pittsburgh Stove & Range Co., Pittsburgh, Pa.
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Richmond Stove Co., Norwich, Conn.
Schlil Bros. Co., Crestline O,
Sheppard, Isaac A. & Co., Phila., Pa.
Smith & Anthony Co., Boston, Mass.
Somerset Stove Foundry Co., Somerset, Mass.
Stamford Foundry Co. Stamford, Ct.
Weir Stove Co., Taunton, Mass

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Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.

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Weiss, H. & Co., 20 Cliff St., N. Y

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Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
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Taylor, N. & G. Co., Philadelphia, Pa.

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Kirk Mfg. Co., Toledo, O.

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Crosby Steam Gage & Valve Co., Boston, Mass.
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Washburne, E. G. & Co., 46 Cortlandt St., New York.

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Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

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Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.
Miner & Peck Mfg. Co., New Haven, Ct.

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Two first-class PLUMBERS; must be strictly sober and reliable; reference required. George E. Bauer, Port Washington, L. I., N. Y. Mar. 22

Three TINNERS for inside and outside work; must be able to make tinware, sheet iron work, spouting, roofing, &c., and all work that is generally done in a tinshop; state experience and salary expected; a steady job for right parties. Box 115, Frostburg, Md. Mar. 22

Two strictly first-class BLOW PIPE MEN; none but good men need apply. Savannah Blow Pipe & Exhaust Works, Savannah, Ga. Mar. 22

A man who has had experience in handling all machines connected with the manufacture of stamped sheet ware, German preferred; state wages; can start at once. "Ware," care *The Metal Worker*, New York. Mar. 22

At once, for first-class country shop 40 miles from New York City, an all round TIN and SHEET METAL WORKER who can cut and lay out patterns, make furnace casings and erect them in a neat mechanical manner; must be good at bench work and outside tinning; a first-class job for a good, steady, sober and industrious man; state age, married or single, and wages wanted. "Journeyman," care *The Metal Worker*, New York. Mar. 22

SHEET IRON MECHANICS who have a knowledge of erecting blow piping; apply, stating age, if married or not, what experience you have had in this line of work and whom you have worked for, and what wages you expect for steady work if you prove satisfactory; we have always had steady work for good men in this line. Apply to Box 428, Hartford, Conn. Mar. 15

Capable and experienced FOREMAN for large sheet metal working factory; must be able mechanic with executive ability; state experience, references and salary expected "Tinware Specialties," care *The Metal Worker*, New York. Mar. 15

FOREMAN for furnace tin shop employing 20 men; must have experience and furnish references. "K.," care *The Metal Worker*, New York. Mar. 15

A good TINNER and PLUMBER who understands the business, for a steady job the year round; please send references and state wages wanted, &c. B. S. Magill & Son, Tidioute, Pa. Mar. 15

A MACHINIST who is thoroughly capable of managing a machine shop where steam and hot water heaters are made; state experience and where, also wages. "Sectional," care *The Metal Worker*, New York. Mar. 15

I have an opening for a first-class FOREMAN and CUTTER for cornice and skylight shop; only men of wide experience and capable of handling high class work and a large number of men need apply; must show a successful past record by unquestionable references. "S. T. L.," 506 Renfost Building, Chicago, Ill. Mar. 15

A first-class TINSMITH; one accustomed to shop work, jobbing, range and furnace work; steady work to reliable, steady man; state wages wanted, &c. F. S. Thompson, Kingston, N. Y. Mar. 15

A first-class PLUMBER and TINSMITH for general work in country shop; must be sober and reliable and have good references; steady job. G. L. Swift's Sons, Marathon, N. Y. Mar. 15

An ASSISTANT SUPERINTENDENT for a foundry making steam and hot water boilers and hot air furnaces and employing about 175 hands; must be thoroughly up to date in all branches connected with such an establishment and not over 35 years of age; to such a party an excellent opportunity for advancement is offered; give reference. "Foundry," care *The Metal Worker*, New York. Mar. 15

One first-class TINSMITH and ROOFER; eight-hour day; good wages to right man. Apply to C. S. McLean & Co., Utica, N. Y. Mar. 15

Two good CORNICE and SKYLIGHT MAKERS; come prepared to commence work at once; eight hours per day; $3 per day. Hugh C. Lendrim, 82 and 84 Clay street, Paterson, N. J. Mar. 15

FOREMAN for galvanized iron shop. "X. Z.," care *The Metal Worker*, New York. Mar. 15

A goood TINNER who can do slating and general jobbing; six miles from city of Pittsburgh, Pa.; steady work and good wages for the right man. Geo. S. Graff, Castle Shannon, Pa. Mar. 15

By a large tinware manufacturer, a young man capable of taking charge of a pieced tinware department; practical man with experience preferred. Address applications "P. K.," 89 Sixteenth street, Milwaukee, Wis. Mar. 15

At once, two good CORNICEMEN for inside and outside work; also two SHEET IRON WORKERS; good wages; apply ready for work. Newburgh Cornice Works, Newburgh, N. Y. Mar. 15

No. 1 TINNER, inside and outside; one that can cut patterns, with some knowledge of skylight galvanized iron and hot air furnace work, capable of putting in a job and taking charge of men; must be sober, industrious and up to date; married man preferred; steady first-class job awaits such a man; state wages wanted. Lock Box 227, Wilson, N. C. Mar. 15

TINNERS can secure steady work and good wages from Love & Casselman, Alliance, Ohio. Mar. 15

A good all around TINNER for the South; state ability and wages wanted; steady job. J. E. Michael, Talladega, Ala. Mar. 15

SITUATIONS WANTED.

As TINNER, by April 1 or 15; 16 years' experience in inside and outside job work; furnace work and assortment; can furnish references if required. G. Stilson, 40 Fremont avenue, Dayton, Ohio. Mar. 22

PLUMBER would like work in country. Thomas Buckley, care Gleason, 2533 Third avenue, New York. Mar. 22

By FOREMAN CORNICE MAKER; has best of reference; not much pay but good man to work. "G. G.," 74 Erie street, Dorchester, Mass. Mar. 22

By a first-class TIN and SHEET IRON WORKER; furnace, steam and hot water heating a specialty; strictly temperate. "F. S. S.," Rocky Hill, Conn. Mar. 22

By an energetic man of mature age and business experience, both private and public, a position by which he can renew his connection with the steam, gas and plumbers' supply trade, either as solicitor of trade, office or business manager. "Reliance," care *The Metal Worker*, New York. Mar. 22

A MECHANIC, CORNICE WORKER and SLATE ROOFER wishes a good job, where it requires a temperate and careful workman to erect work; am no cutter; have worked in large shops; am 38 years of age; wages were from 35 to 40 cents per hour last season; only reliable firms who appreciate good work done by a union man may address Wm. M. Guthrie, 29 South Lille street, Ft. Wayne, Ind. Mar. 22

By an all around man at plumbing, tin and sheet iron and furnace work; steady, sober and reliable; New England preferred. H. Dearborn, 56 Spencer avenue, Chelsea, Mass. Mar. 22

Fully experienced and competent PLUMBER and GAS FITTER seeks employment in out of town shop; steady man. Harry Webber, 1393 Second avenue, New York. Mar. 22

By a young man as CORNICE and SKYLIGHT WORKER; moderate wages; any part of the country. "A. G. B.," care *The Metal Worker*, New York. Mar. 22

SALESMAN, age 35, thoroughly acquainted with the heater, range and tin plate trade in Philadelphia and vicinity; can take work off plans, estimate on same and superintend the erection of work; has acquaintance of 12 years with the leading architects and builders and the trade; is also first-class office manager and correspondent; highest references. Chas. E. Bonnet, 2155 North Twenty-ninth street, Philadelphia, Pa. Mar. 22

TIN and SHEET IRON WORKER, any kind, or general jobbing shop. "Smith," 284 Third avenue, New York. Mar. 22

PLUMBER and GAS FITTER; young man, competent and reliable; willing to go anywhere, South or Southwest preferred; union man. Edw. F. Walsh, 407 East Eighty-first street, New York. Mar. 22

By capable man with wide experience in buying and selling hardware, paints and stoves, as CLERK or MANAGER in retail store; excellent references. Thomas Brown, 32 Hawley street, Boston, Mass. Mar. 22

As TIN and SHEET IRON WORKER; understands furnace work and general job work. "O. K.," 470 Shonnard street, Syracuse, N. Y. Mar. 22

A first-class licensed PLUMBER would like position in country; sober, honest and industrious; capable of taking charge of work; jobbing or new work preferred. Thomas S. Moran, 71 West Ninety-sixth street, New York. Mar. 22

By young PLUMBER and GAS FITTER in any out of town shop. Geo. Stilley, 561 West Thirty-seventh street, New York. Mar. 22

By young man of 28, married, a steady position in some large town; am a good PLUMBER and GAS FITTER, also can do hot air heating, estimate and figure from plans, and can do all kinds of country work, pump, wind mills, &c.; lately in business; any one wishing a man in this capacity please address "A. J. K.," care *The Metal Worker*, New York. Mar. 22

By a practical man with 20 years' experience as SUPERINTENDENT or FOREMAN in a cornice or skylight shop; can do drafting, cutting, estimating, also can handle men to advantage; best references. Emrih Kunay, 96 Avenue A, New York. Mar. 22

As TRAVELING SALESMAN for hardware or stoves, either or both combined, for either wholesale house or manufacturer; have had long experience in hardware business; references exchanged. P. O. Box 170, Clarksville, Va. Mar. 22

To correspond with those having use for a man in steam, water and hot air heating, tinsmithing, gas fitting and plumbing; capable of figuring from plans and taking charge of workshop. Jos. A. Walker, Norway, Maine. Mar. 22

PLUMBER, 24 years of age, would like steady position; seven years' experience; understand plumbing in all its branches. "A. B. C.," 17 Sprague avenue, Middletown, N. Y. Mar. 22

A first-class mechanic, 33 years of age, married, would like to correspond with firm in need of a sober, industrious man to take charge of sheet iron department; accustomed to heating and ventilating by blower system; also ship and engine work, tanks, filters, cowls and stacks; first-class layer out; can also make working drawings; best of reference. "O. K.," 310 New street, Philadelphia, Pa. Mar. 22

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By a PLUMBER, TIN and SHEET IRON WORKER; hot air and hot water heating; general all around man; can estimate and work from plans; references if required. Joseph M. Nangle, 24 Traymore street, North Cambridge, Mass Mar. 15

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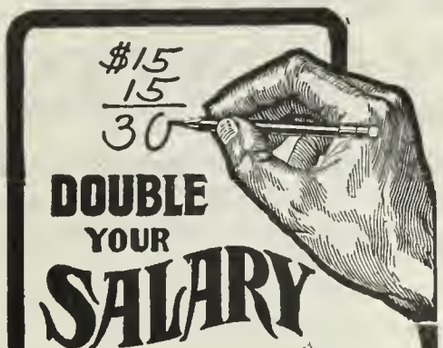
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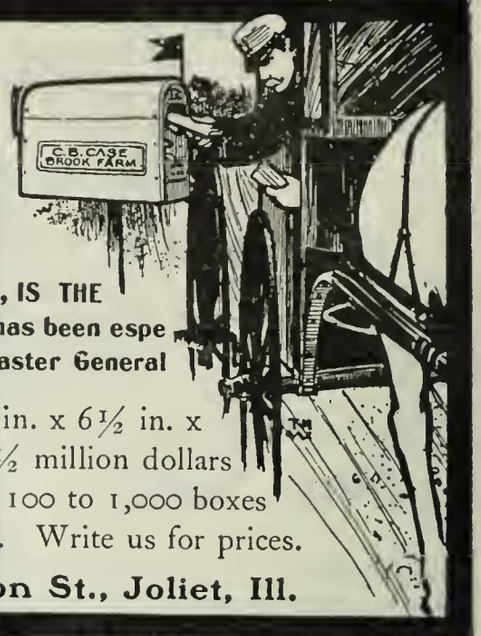
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Chemists to the New York Produce Exchange.

{ Pierre de P. Ricketts, E.M., Ph.D.
{ John H. Banks, E.M., Ph.D.
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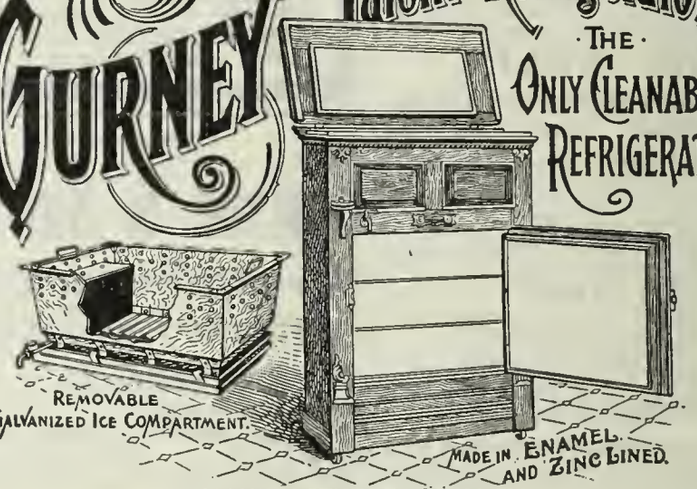
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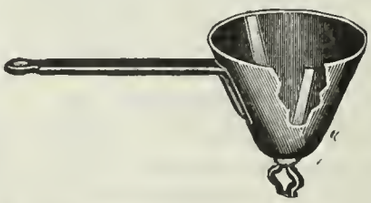
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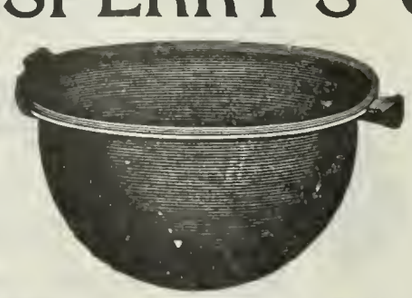
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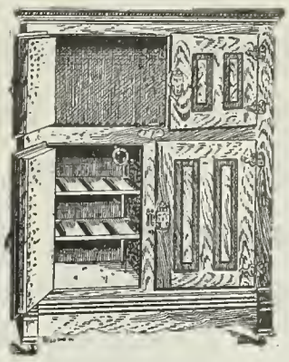
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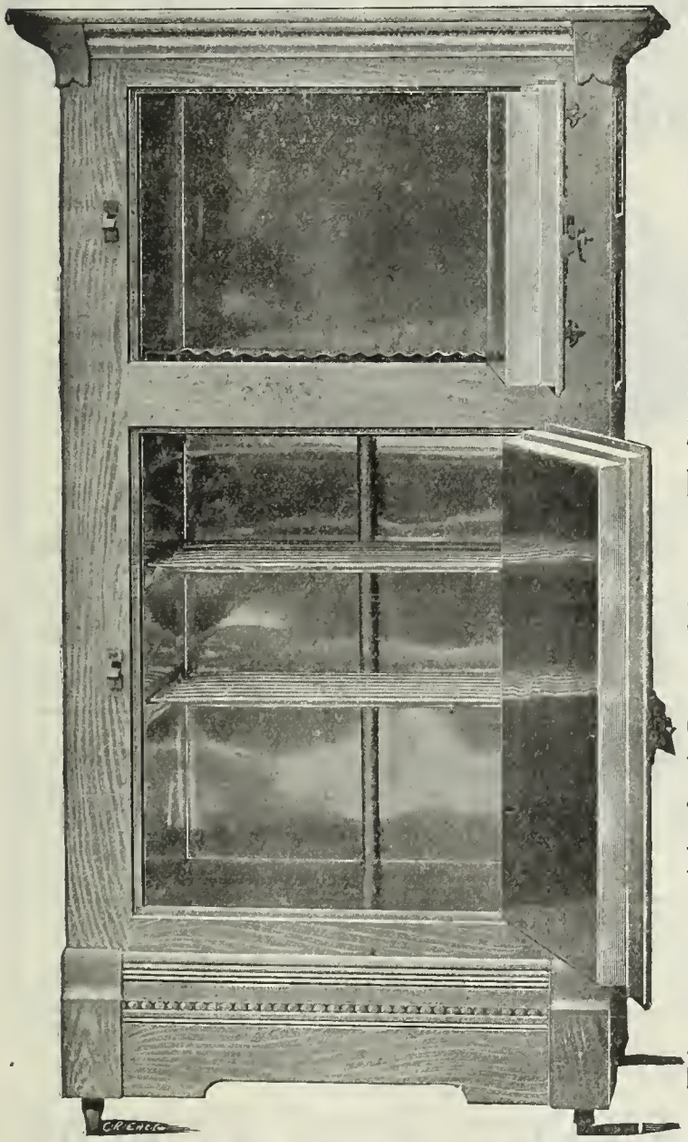
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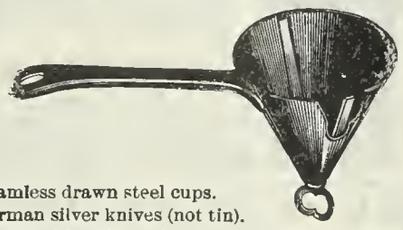
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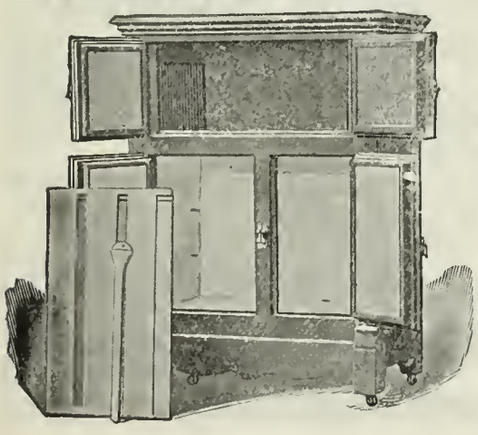
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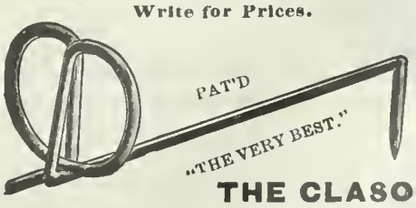
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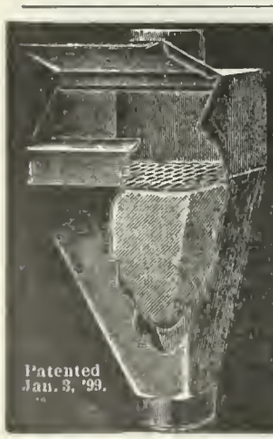
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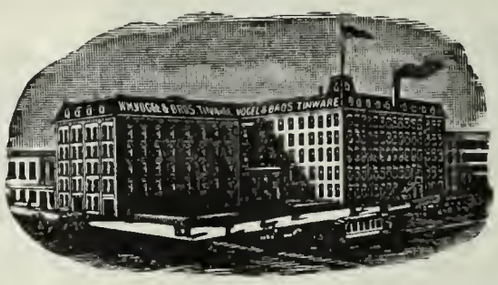
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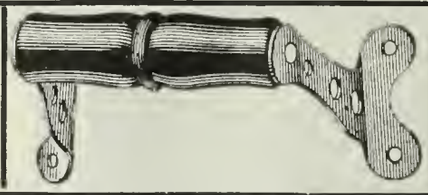
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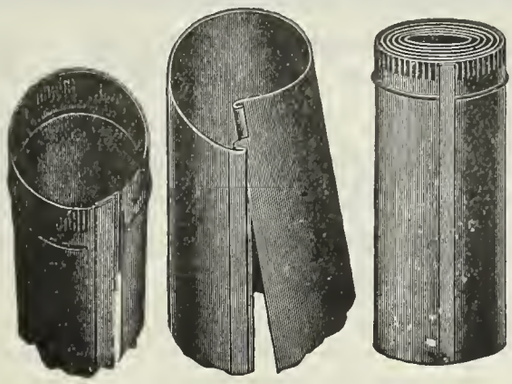
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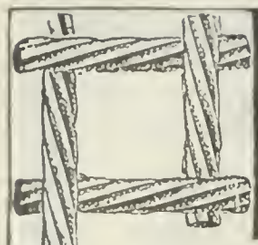
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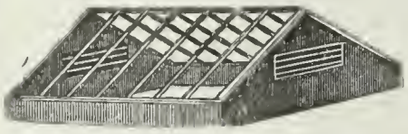


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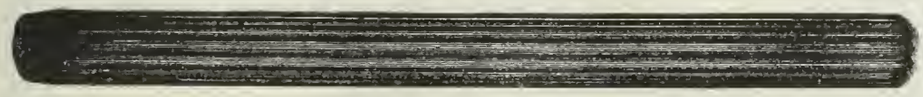
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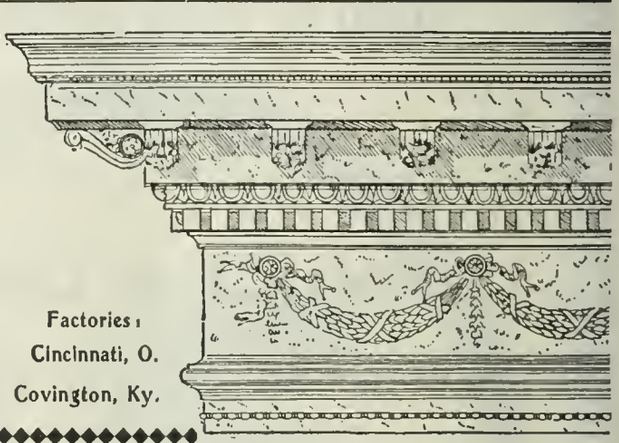
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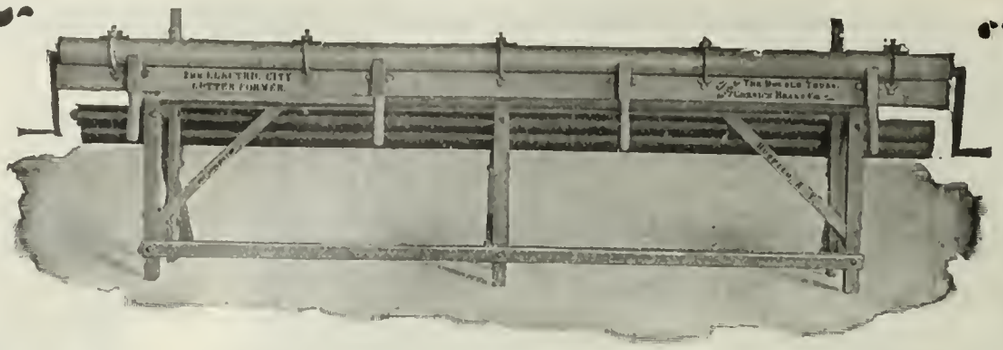
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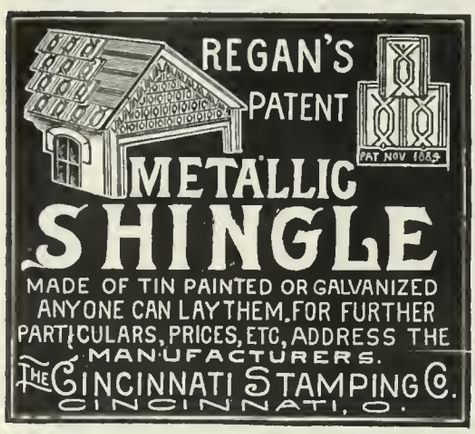
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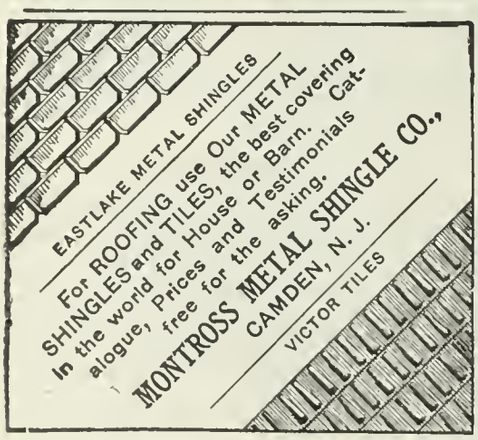
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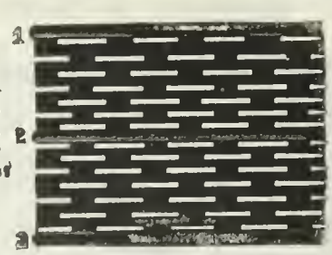
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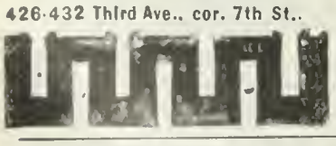




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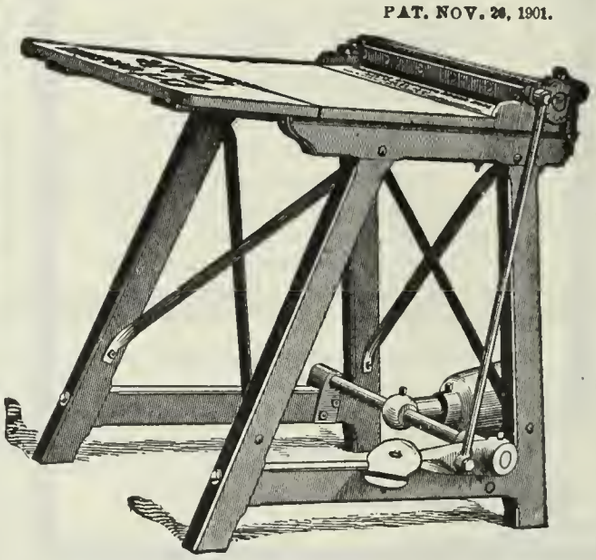
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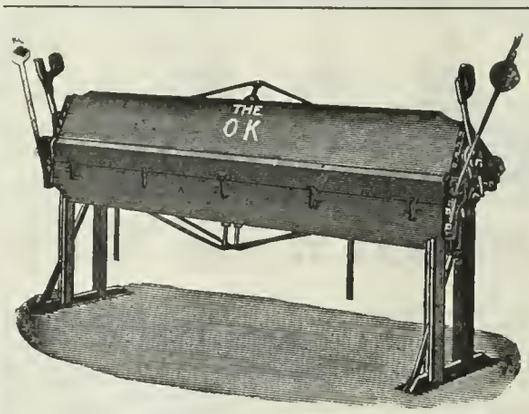
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GEO. CALLAHAN & CO.,

Mfrs. Machinery and Cylinder Oils, Belt Dressing Greases, &c. Plumbers' and Tinners' Sundries. Our Cutting Oil at 60c. per gal. is equal to best Lard Oil. Our Ajax Cutting Oil at 40c gal. is better than most cutting oil sold.

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The Largest Variety of Squaring Shears for Foot and Power

Cutting Length from 2 to 11 feet. Capacities from the lightest sheets up to 1-4 inch stock.

MODERN CONSTRUCTION. BEST WORKMANSHIP.

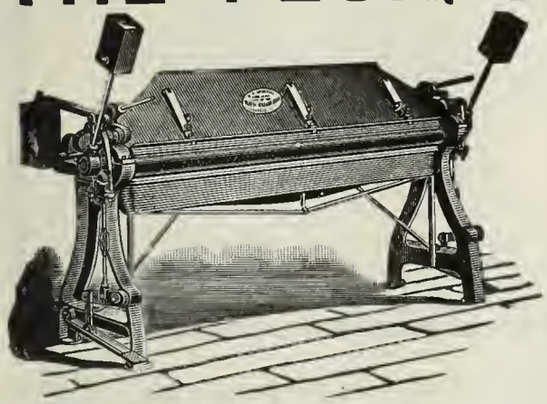
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—AND—
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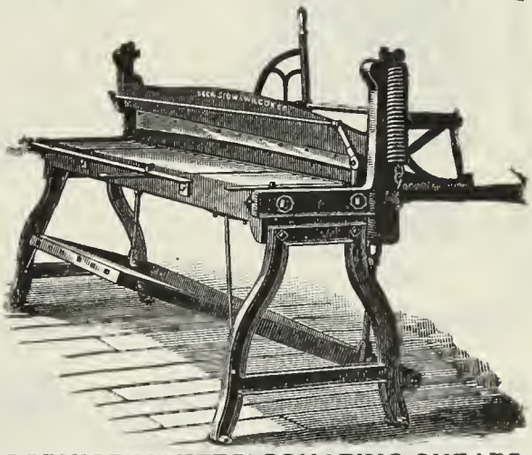


HARE'S FOUR LEAF CORNICE BRAKE.

Hundreds sold and never a complaint. Works easily and rapidly. The universal verdict is, IT IS THE BEST IN THE WORLD.
96 inches long.

Tinsmiths' Tools of the Highest Grade.

Our *Improved Eureka Cornice Brake.* Will bend No. 20 iron.
96 inches long.



CORNICE MAKERS' SQUARING SHEARS. With Lever Arc, Automatic Gauge. Will cut No. 22 iron
97 inches long.

HERCULES SHEARS



make the cutting of sheet metal of heavy gauges an easy task for the mechanic and a profitable operation for the employer. With them a man can cut No. 12 steel with one hand on the lever, leaving the other hand free to guide the stock while cutting elbows, ties and circles, as small as 8 inch radius; this is done without burring or buckling either piece, thus avoiding hammering and straightening, which add to the cost of the product. They split sheets of any width or length up to No. 12 gauge, cut wire or bar-steel ⅛ inch thick, cut off and mitre angle iron ⅛ inch thick, and do it perfectly.

WRITE FOR LOWER PRICES.

Manufactured by

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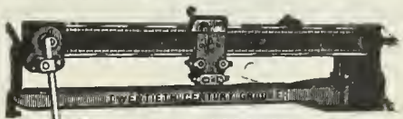
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20th Century Groover

for Hand Power. We also make them for Belt Power.



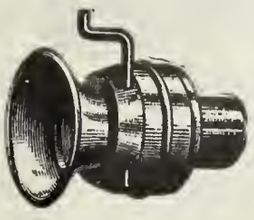
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Operated from one position. Automatic knock-out and *Quick Return.* Grooves 22 gauge.
Write for circular. Made by
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W. R. OSTRANDER & CO.,

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Manufacturers of
Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I.
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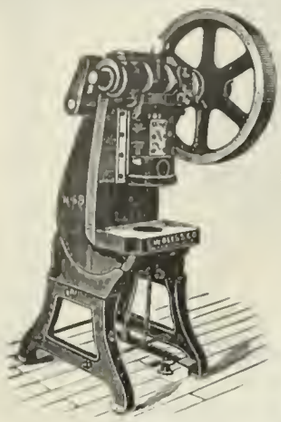


THE fact of the matter is, from an Architect's standpoint, a Cortright Metal Roof is an everlasting proof of his good judgment.

Cortright Metal Roofing Co. NONE BETTER
50 N. 23rd St. Phila.

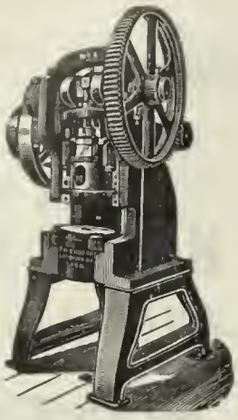
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E. W. BLISS CO., BROOKLYN, N. Y., U. S. A.



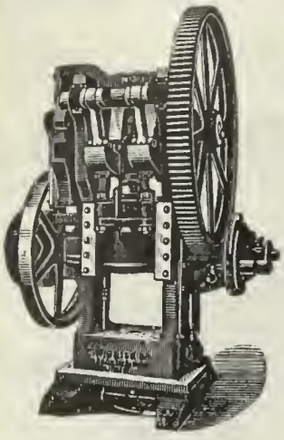
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Made in 5 sizes, weighing from 750 to 3,800 lbs.



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Made in over 15 sizes, weighing from 5,600 to 150,000 lbs.

PRESSES FOR ALL KINDS OF DRAWING OPERATIONS.

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BERLIN AGENCY, VIENNA AGENCY, COLOGNE AGENCY, STOCKHOLM AGENCY, ST. PETERSBURG AGENCY, Schuchardt & Schütte.

We have been **AWARDED** the **GRAND PRIZE** at the **PARIS EXPOSITION** of 1900 for the **Unsurpassed Excellence of our Machinery.**

With our greatly increased foundry facilities we are now in a position to furnish a superior quality of castings in dry sand, green sand and loam, up to 30 tons in weight. We solicit orders for this kind of work.



WE ARE SENDING THEM IN ALL DIRECTIONS.

Correspondence Solicited. **Estimates Furnished.**

Also Owning and Operating **The Stiles & Parker Press Co.**

BEST HAND AND POWER MACHINERY
FOR RANGE & SHEET IRON WORK
PUNCHES SHEARS



PRESSES BRAKES

EXCELSIOR TOOL & MACHINE WORKS
212-214 SPRUCE ST. ST. LOUIS, MO

GEO. A. OHL & CO.,

157, 159, 161 Oraton St., NEWARK, N. J. (Telephone 873.)

Manufacturers of all kinds of **Metal Workers' Machines,**

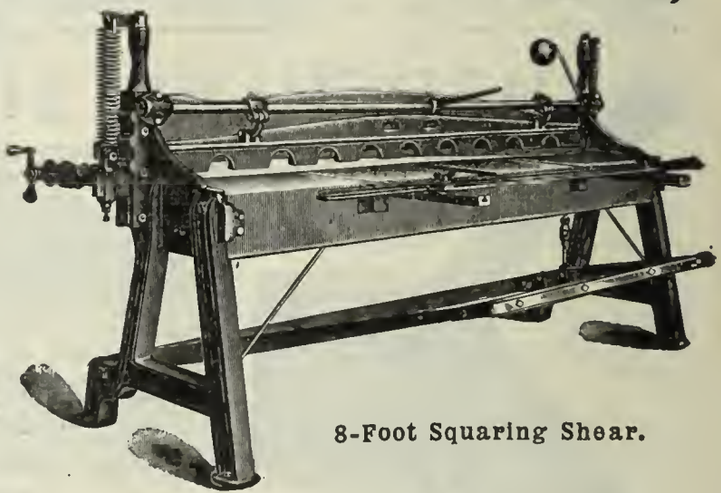
BRAKES

(ALL SIZES),

Heavy and Light

Squaring Shears,

Punches, Presses, Sheet Steel Lath Machines, Drop Presses, Draw Benches, and ***Special Machinery*** of all descriptions.



8-Foot Squaring Shear.

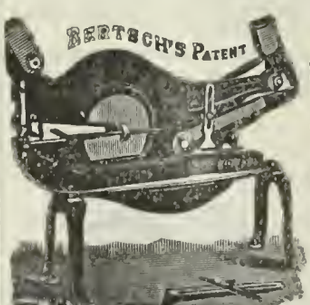
THE FRED. J. SWAINE CO.

PRESSES. DIES.



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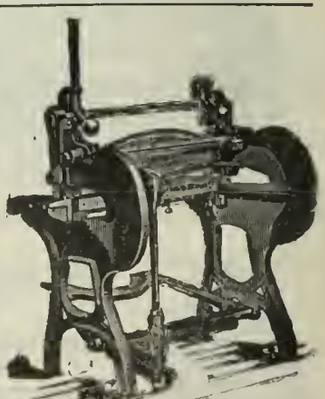
Sheet Metal Tools



For any and all Purposes.

SHEARS, PUNCHES, Etc.

SPECIAL SHEET METAL WORKING MACHINERY FROM SPECIFICATIONS PRODUCED ON SHORT NOTICE.



Write for Prices and Descriptive Circulars.

BERTSCH & CO., - - Cambridge City, Ind., U. S. A.

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HAND POWER BRAKE

NEW IMPROVED GEARED.



6 AND 8 FOOT.

Will bend No. 14 gauge and lighter, or when double geared with hand power will bend No. 10 gauge in 6 and 8 foot lengths. Write for descriptive circular and prices.

The J. M. Robinson Mfg. Co.,
225-229 West 2nd St.,
CINCINNATI, O.

KEENE FOOT POWER
CORNICE BRAKE.

Easiest to Operate, Strongest and Best.

SHEET METAL WORKING MACHINERY OF ALL KINDS.

FOOT POWER
CURVE MOULDING HAMMER.

The cheapest, most convenient and best sheet metal moulding former ever offered. Produces a greater variety of work than any other. Quickly adjusted and easily operated. Write for prices and discounts on this or any sheet metal working tool you may desire. We will name you bottom prices.



CINCINNATI, O

DOUBLE LEVER PUNCH.



Capacity, ½ in. hole in ¼ in. iron.

Send for Circular and Price.

PHILADELPHIA MACHINE TOOL CO.,
445 North Darien St., Phila., Pa.
TESTING MACHINES and *SOLE AGENTS* for HENNING TESTING APPARATUS.
PRESSES and SHEARS, CORNICE PRESSES CURVED MOULDING MACHINES, etc.

SHOVEL MACHINERY

We build complete equipments and control the latest patented machines for this work.

TIN CAN MACHINERY.

We make the very latest improved machinery for manufacturing cans and pieced tinware.

STEEL RANGE MACHINERY.

Recognized leaders for machinery and dies for oil and gas stoves, and gas and steel ranges.

For further particulars write

THE TOLEDO MACHINE & TOOL CO., Toledo, Ohio, U. S. A.

SELIG-SONNENTHAL & CO., Agts., London, England.

— CONTENTMENT.—Giles: "A Happy New Year to you, marm, and I hope you'll be as lucky this year as I was last."

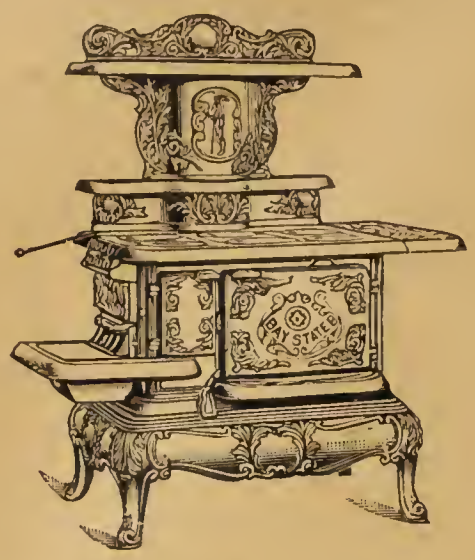
Lady: "Oh, thank you very much, Giles; but you surely forget that you lost your wife in the spring and broke your leg in the summer."

Giles: "Yes, but t'other leg's all right, and as for paw Soosan, it might have been I to be took instead."—*Punch.*

— TIME NOT AT FAULT.—"I never tell all I know," he said, intending to be mysterious.

"Well," she replied, "it certainly can't be because you don't have time."—*Chicago Times-Herald.*

"A good name is rather to be chosen than great riches."



But if *both* the "*good name*" and the "*riches*" can be realized, is it not much better? The name "BAY STATE" for 65 years has stood for all that is best in stove construction, and means good profits to the man who handles

"BAY STATE RANGES and FURNACES."

BARSTOW STOVE COMPANY,

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TO LIGHT A CHURCH

Or any room pleasantly, economically and effectively is not a simple matter. Mistakes occur where least expected I have made such lighting a specialty for over forty years. Send for estimates.

I. P. FRINK, 551 Pearl St., New York.

L. & R. WISTER & CO.,

Bullitt Building, Philadelphia

Dunbar Foundry Pig Iron
Dunbar Connellsville Coke for Foundry Use.
American Sheet Iron Co.'s Sheet Iron.
American R. G., cleaned of uniform black color.
Dealers in all kinds of Iron and Steel Scrap.

BRUCE & COOK,

TINNERS' TOOLS and MACHINES.

TINNERS' SUPPLIES.

186, 188 & 190 Water Street, and 248 & 250 Pearl Street, NEW YORK.



Ideal Sap Spout

Are made open or closed, and a full line of other Maple Sugar goods. Send for dealers' price list.

CHARLES MILLAR & SON CO, Utica, N. Y.

HUB RANGES

If you want the best line; the line with the **most attractive** and progressive selling features, look into the merits of the

Hub
Line of Ranges
Steam and Water Heaters;
Hot Air and Combination Furnaces.

SMITH & ANTHONY CO., Boston.

TAYLOR OLD STYLE

is the only brand of roofing tin that has ever been imitated.

Count the imitations and you will realize what this means.

N. & G. TAYLOR CO.
Sole Manufacturers
PHILADELPHIA

Building a Business

on meritable goods is the motto of the man who handles the Glenwood line. He knows their reputation and quality. He knows that every part of a Glenwood range or heater is fitted and finished like a piece of machinery. He knows that every Glenwood sold means a satisfied customer–that's why it's business and a pleasure to handle

GLENWOODS.

Write the Weir Stove Company, Taunton, Mass.

SOLDER

Our Various Brands:

ADMIRAL,
FORT PITT,
FREEHOLD,

Are made from strictly New Metals and the Proportions Guaranteed.

McCLURE & CO.,
Manufacturers of Tin Plate,

PITTSBURGH, PA., 211, 213 and 215 Second Ave.
PHILADELPHIA, PA., 115 North 7th Street.

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The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

LVII. ER 13. | NEW YORK AND CHICAGO, MARCH 29, 1902. | ONE DOLLAR A YEAR. SINGLE COPIES 5 CENTS.

"RUFF AND TUFF"

That's the Name for our Make of . . . .

SPECIAL SOLID PIPE DIES.

Made from the Finest Grade of Tool Steel. Tempered by Experts. Will Outwear the Ordinary Ones Several Times.

OUR CATALOG OF ENGINEERS' AND STEAM FITTERS' TOOLS WILL INTEREST YOU.

ALWORTH MFG. CO. *Boston, 128 Federal St. New York, Park Row Bldg.*



The Gorton Side Feed Boilers

FOR STEAM AND HOT WATER HEATING.

INVESTIGATE FOR YOURSELF.

Send for Catalogue and Prices.

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McLEOD & HENRY CO.,

TROY, N. Y.

AMERICAN STEAM and ALTITUDE GAUGES, POP SAFETY VALVES.

Heating Specialties. American Steam Gauge & Valve Mfg. Co., Bismark St., Boston, Mass., U. S. A.



TAKE YOUR TIME

to select the hot air furnace that is especially adapted to your customer's wants. If there is a more complete line of hot air furnaces made in this country than the **PARAGON** line, we have not yet heard of it. There is absolutely no necessity for a dealer to go outside the Paragon Furnace catalog to meet the wants of his most capricious customer. And the price is right, too. Send for catalog and discounts to the trade.

ISAAC A. SHEPPARD & CO.,

NEW YORK. PHILADELPHIA. BALTIMORE.

POLLO BEST BLOOM GALVANIZED IRON

very sheet ought to be per- if not, return it at jobber's nse.

he worker wants good iron ell as skill and good tools. pollo is right in a dozen where other galvanized are sometimes right and times wrong.

ican Sheet Steel Company, New York.

If the appearance of a stove appeals to the housewife it is more than half sold.

Stewart Ranges

have handsome exteriors, and then they are good bakers.

FULLER & WARREN CO., Troy, N. Y.

This Ad. changes every week.

NOTICE.

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Write for prices to John Sommer's Son, 355-365 Central Ave., Newark, N. J.



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GLOBE and ANGLE VALVES, IRON and BRASS.

All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.

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328-330-332 Second Ave.,
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Galvanized and Black Sheets.

The Leaders:
Follansbee Pure Iron Old Style; made specially, having Charcoal Iron Base.
Also, Scott's Extra Coated, well known everywhere.
Samples on application.

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eam Specialties.

EF and NOISELESS BACK ATOR VALVES, PRESSURE VALVES, M TRAPS, PUMP GOVERNORS, M AND WATER STEAM and OIL SEP- CING VALVES, ARATORS TEMPERATURE CONTROLLER and No. 1 DAMPER REGULATORS

KIELEY AND MUELLER, W. 13th St., - NEW YORK.

JENKINS IMPROVED AUTOMATIC AIR VALVES.



Suitable for high or low pressure. Take no more room than an ordinary air cock. Endorsed by the leading steam experts as the best made and the quickest working. All genuine stamped with our Trade Mark.

JENKINS BROS., New York, Boston, Chicago, Philadelphia.

READ OUR "AD"
Page 7.
MAGEE FURNACE CO.,
Boston.

ROUND OAK
STANDARD of AMERICA

The Round Oak Steel Range

is the kind of a range
you want to sell
to your good
permanent lasting customers.

It is also the
kind of a range
you want
to sell to the man
to whom you have
never sold before.

You want a
good range to sell
to keep the trade
that you have
and bring new trade
to your store.

If everything in your store
was as good
in its way as
the Round Oak steel range
is in its,
you would have
a mortgage
on all
the good trade
in your town.

Suppose you consider this!
Perhaps you can
take it up
and make a successful
"run" with it.



A "Run" by Doe-Wah-Jack

Estate of P. D. Beckwith,
Dowagiac, Michigan.

MAKERS OF GOOD GOODS ONLY.

ROGERS & WELLS, CHI. F.B.S.

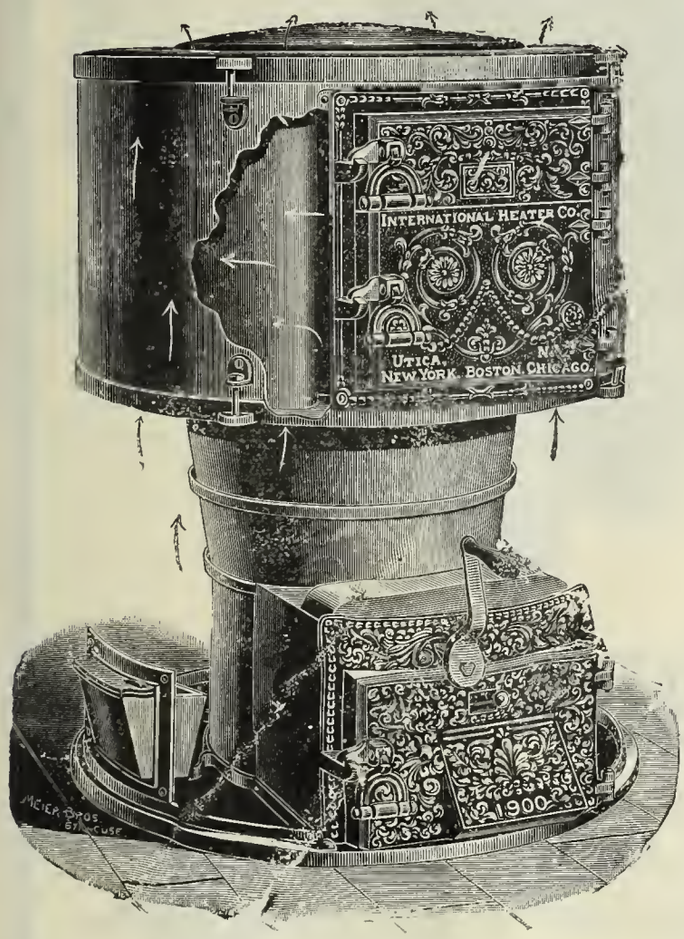
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CHANCE CUSTOMERS BECOME PERMANENT;
EVERY SALE PROVES AN ADVERTISEMENT.

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IMPROVED

WARM AIR FURNACE

With Natural Gas Ring if desired.



Large Double Feed Doors.

Generous Combustion Spaces.

Large Area of Radiating Surtace.



Automatic Gas Damper.

A THOROUGHLY GOOD HEATER AT A MODERATE PRICE.

International Heater Co.,

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Largest Makers of Heaters in the World.

MOORE'S
QUICK OVEN STEEL STOVES



BACKBONE

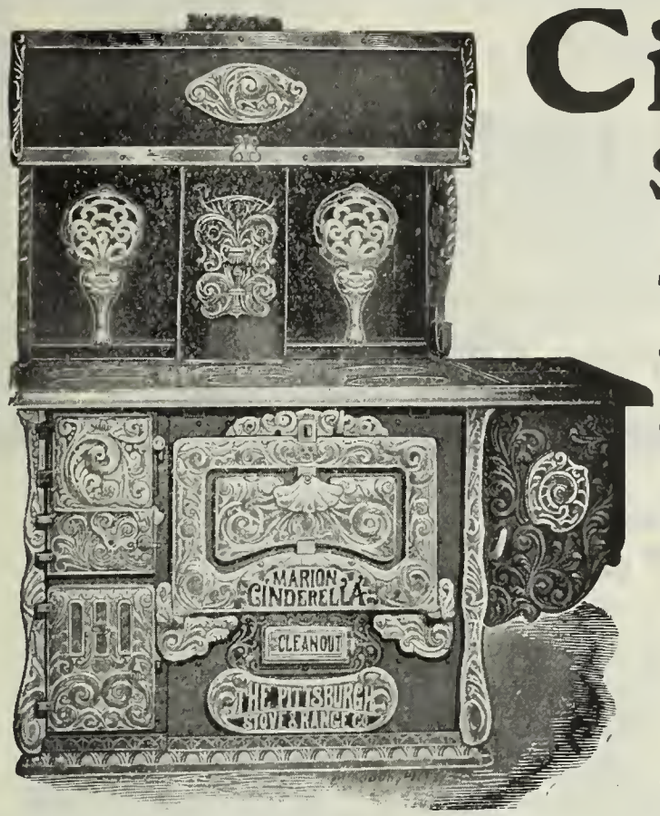
THERE'S NOTHING LIKE IT FOR KEEPING THINGS STRAIGHT.

In the putting together of *Moore's Quick Oven Stoves*, the flue strips are so attached to the Oven Bottom as to give it a real backbone and a rigid straightness, which you can count on being just the same in ten years as on the day the stove is sold. Our construction is the only one which insures this.

JOLIET STOVE WORKS,
JOLIET, ILL.

HOLBROOK, MERRILL & STETSON, San Francisco, Sacramento, Los Angeles.

38



Cinderella
Steel Ranges

REPRESENT

The Best Materials,
The Best Construction,
The Best Workmanship.

THEY ARE

The American Standard for Excellence.

ALL STYLES AND SIZES AT MODERATE PRICES.

We would be pleased to send our catalogue.

STOVES AND RANGES CINDERELLA NEVER FAIL

PITTSBURGH STOVE & RANGE CO.,

PITTSBURGH, PA.

WESTERN SALES AGENT,
W. D. Sager, 38 and 40 Michigan St., Chicago, Ill.

STOVES AND RANGES CINDERELLA NEVER FAIL



NOVEL ECLIPSE.

NEW
LOW-PRICED
OAK.

Latest and Best.

Five Sizes, Well Made and Durable.
Write for Description and Prices.

THE

Eclipse Stove Co.,

MANSFIELD, OHIO.



OUR

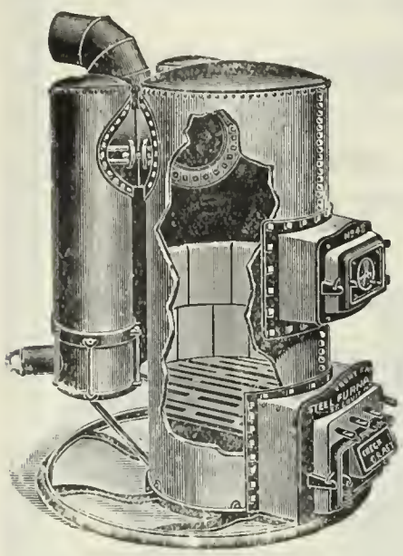
CATALOGUE,

SHOWING

GAS RANGES
CAST RANGES
STEEL RANGES
STEEL COOKS
HOT PLATES
CAST and STEEL HEATERS

WILL BE FURNISHED FOR THE ASKING BY

Enterprise Stove Co., VINCENNES, IND.



Front Rank Hot Air Furnaces

are built on vertical lines; air comes in direct contact with entire heating surface.

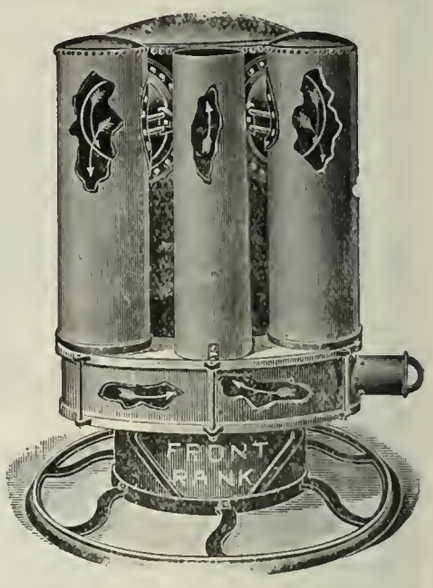
The Front Rank Fire Chamber is one solid sheet of closely riveted steel; being lined above the fire lines with genuine fire clay tiling it is the most durable made.

The radiators are very large and have an unusual area of heating surface in comparison with the size of fire pot.

These furnaces burn hard or soft coal or coke. We also make wood burning furnaces.

Send for our catalogue, it will give you a better idea of what we make.

FRONT RANK STEEL FURNACE CO.,
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REFRIGERATORS,
BLUE FLAME OIL STOVES,
GASOLINE STOVES.

LARGEST JOBBERS in NEW ENGLAND.

GAS RANGES,
FURNACES, STOVES,
RANGES AND REPAIRS.

HENRY N. CLARK CO., 56 and 58 UNION ST., **Boston, Mass.**

BRAND STOVE CO.

STOVES, RANGES and FURNACES.

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ACME LINE, 1902.

Asbestos Lined Ranges and Ovens, Cookers and Hot Plates.

FOR ALL GASES



Catalog No. 35 on application.

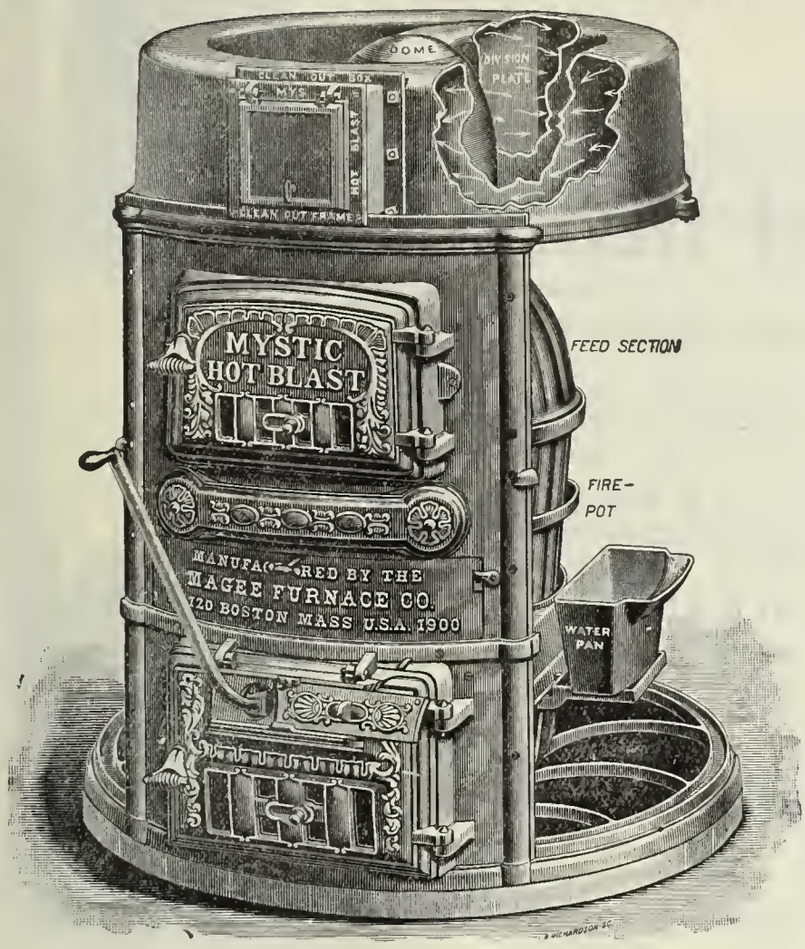


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HENRY WATERMAN, - - 195 Lewis St., N. Y., Eastern Agent.

MAGEE MYSTIC HOT-BLAST FURNACE

Cast to Last.



No heater can be better than the material put into it. It may be worse. The material that enters into the

Magee Mystic Hot-Blast

is the best, while the Magee process of building is the result of 50 years' cumulative experience, seconded by unparalleled producing facilities.

FEATURES.

Low Construction, with either Solid Cast or Wrought Iron Return Flue Radiator; Economical; Durable; Easily managed. Heavy Sectional Pots; Cup Joints.

Write for our Furnace Catalogue.

MAGEE FURNACE CO., = BOSTON.

Most Complete Line under one name in the United States.

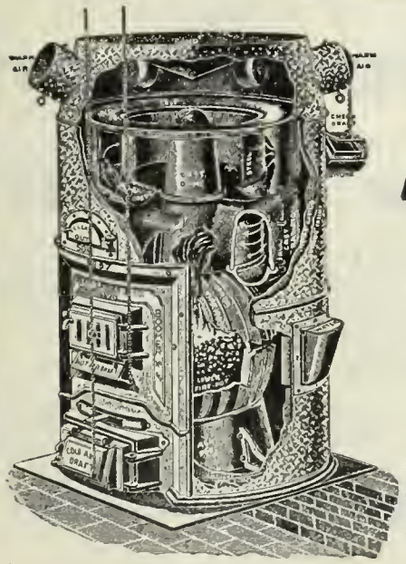
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REGARDING

Boomer Furnaces.

OR

Boomer Steel Ranges



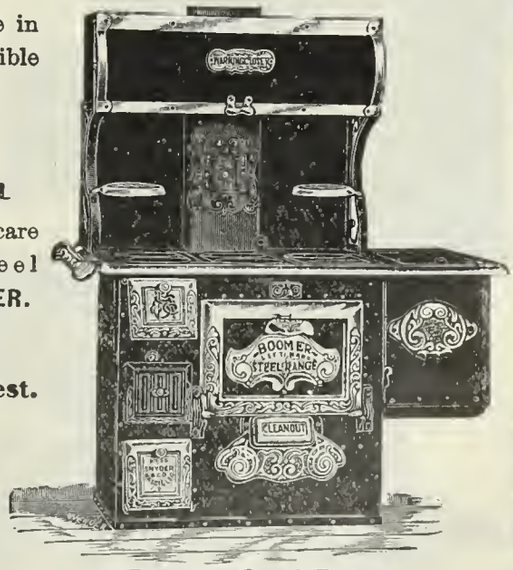
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We want to state in strongest terms possible that if you want the

HEAVIEST,
MOST DURABLE,
MOST ECONOMICAL

and easiest to take care of Furnace or Steel Range, buy a **BOOMER.**

Neither time nor money is spared to make them the Best.
Buy Boomers and save your coal bills.
We invite investigation.



Boomer Steel Range.

THE HESS-SNYDER CO.,

Manufacturers, MASSILLON, O.





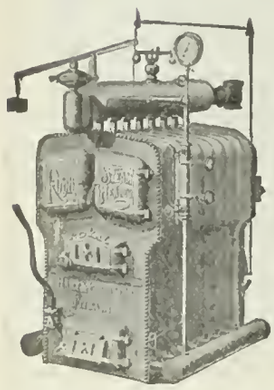
Royal Heaters.

HART & CROUSE CO.,

235 Water St., New York. 78 Lafayette St., UTICA, N. Y. 79 Lake St., Chicago.

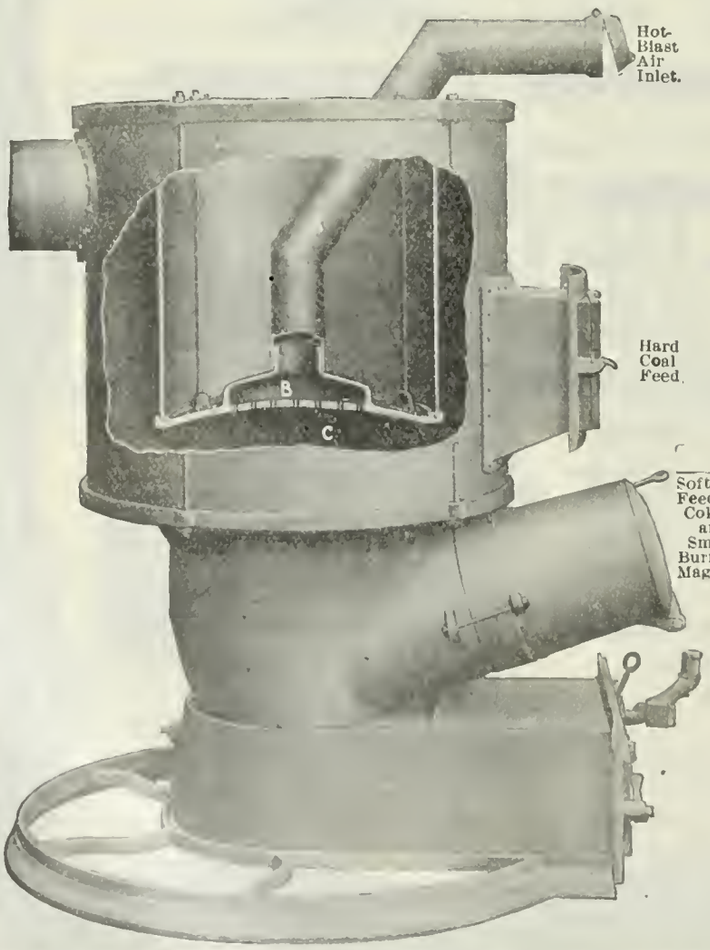
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STEAM,
HOT AIR.





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FOR THE DEALER.

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In construction the Patric Furnace is exceedingly simple. This point always appeals to the prospective purchaser. No clogged radiator. It needs no clean-outs. Look at the illustration and see for yourself.

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Our hot-blast device for aiding combustion delivers heated air directly into the combustion chamber. No part in the fire to clog or burn off. Your customers must have a hot-blast.

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THE H.B.SMITH CO.,

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Catalogue furnished only upon application to

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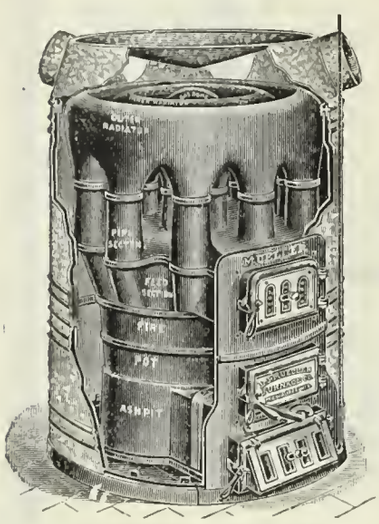
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If your price to your customer is in proportion to the price you pay us for it, so much the better for your customer.

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IF WE CAN'T FIT YOU OUT,
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Furnaces and Boilers

MADE IN

16 DISTINCT STYLES

FOR ALL CONDITIONS—
FOR ALL KINDS OF FUEL.

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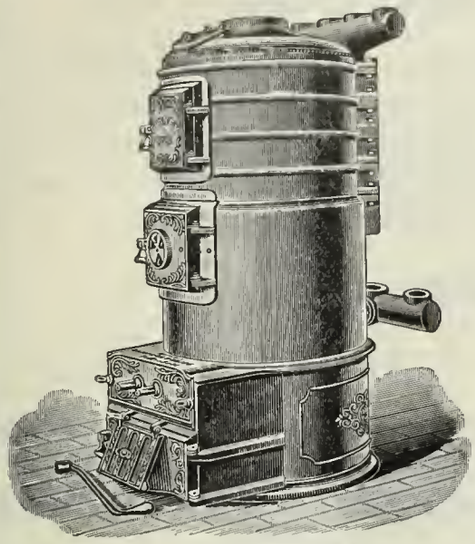
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LONG while, isn't it? A man ought to learn something in that time, hadn't he? Well, we don't know it all, but we do know how to make Furnaces. Our apparatus, owing to its tubular construction, carries away the heat as fast as made, not allowing the air to become burnt or overheated. From a sanitary point of view it has no rival. We embody in our goods only the best materials and workmanship. Say! Mr. Dealer, there's a good profit in it, too.

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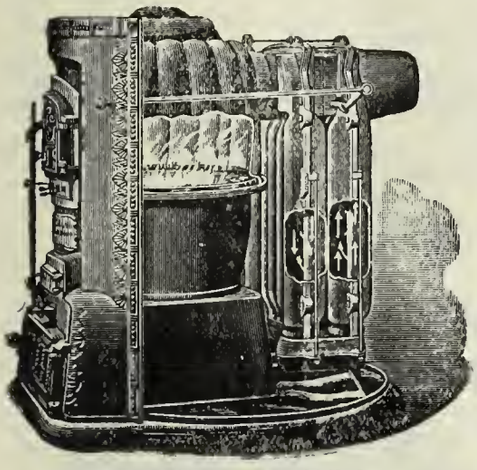
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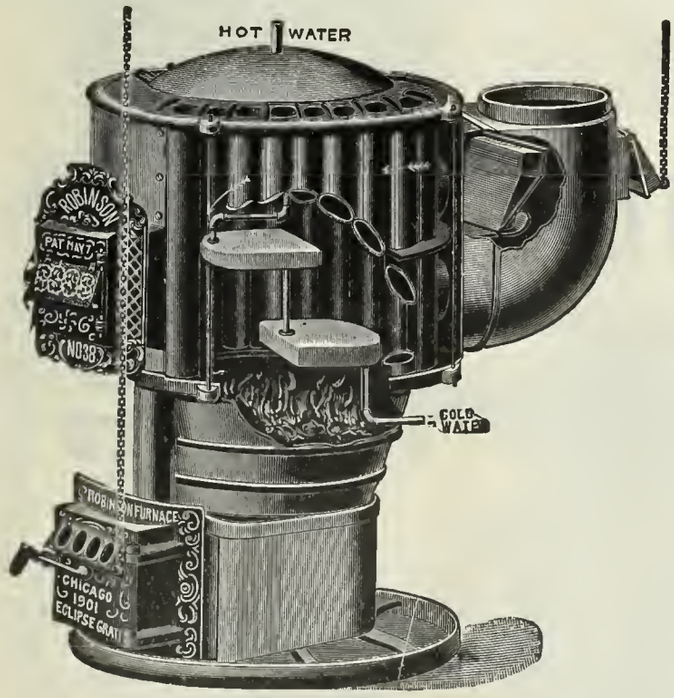
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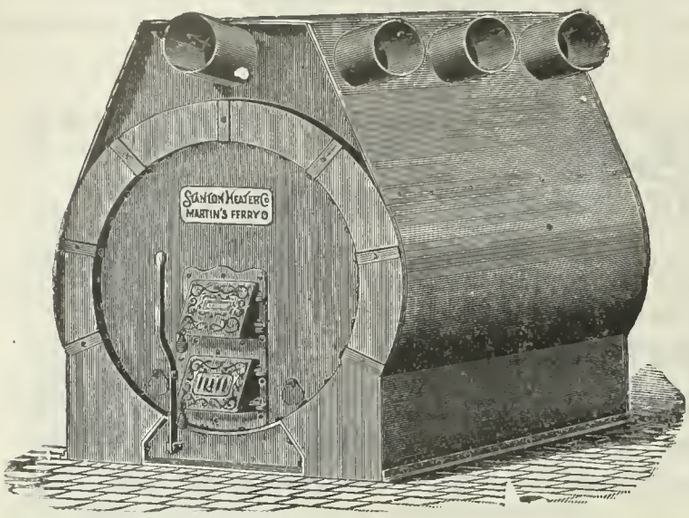
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If backed up by our line. We make many kinds and sizes of steam and hot water boilers, and you as a dealer ought to know all about this line. Let us send you our printed matter and post you on the standard line. Write to-day.

KEWANEE BOILER COMPANY

KEWANEE, ILLS.

The Stanton Seamless Heater,



PORTABLE CASED.

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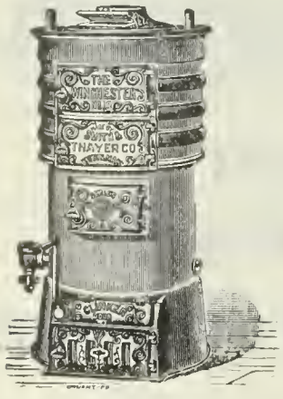
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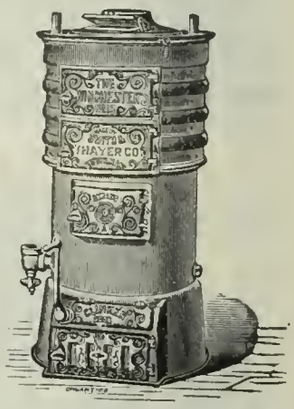
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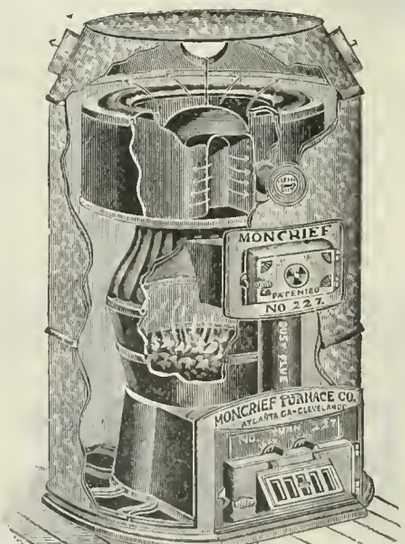
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handsomely illustrated
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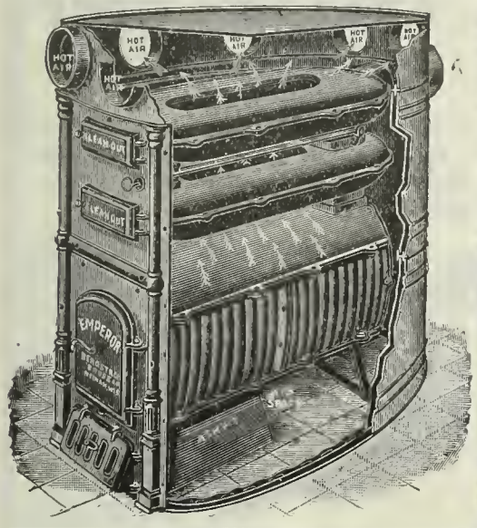
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FOR WOOD.

Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces. . . .
Furnished for either Brick or Galvanized Iron Casing

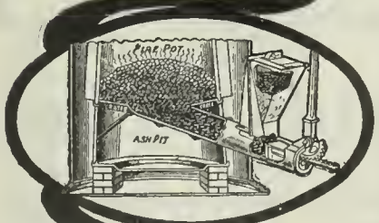
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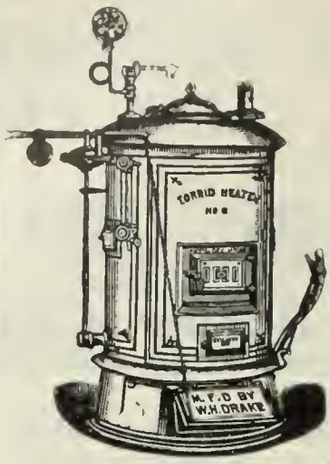
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They Fit Any Furnace.



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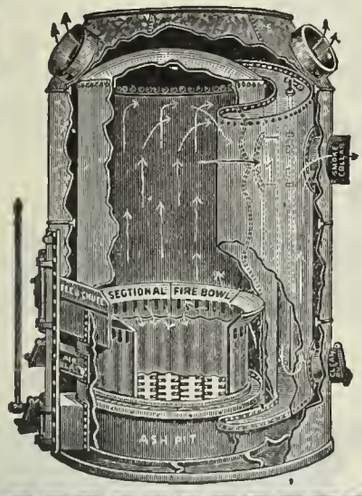
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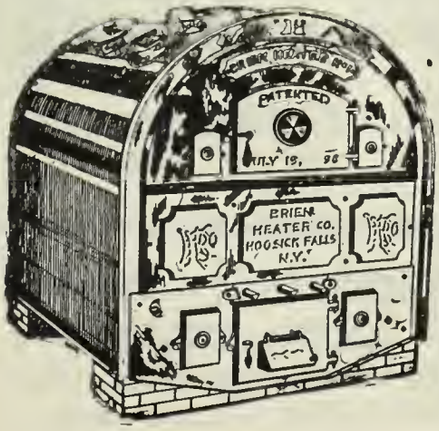
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BAKES EVENLY BY THE CIRCULATION OF HOT AIR.
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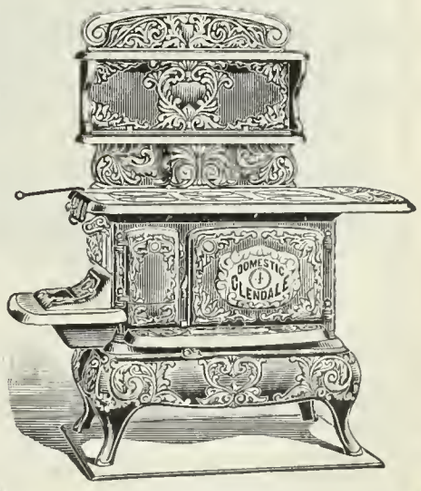
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Circulation is Positive.
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GLENDALE
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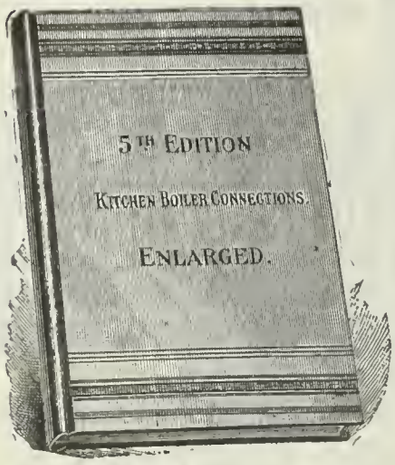
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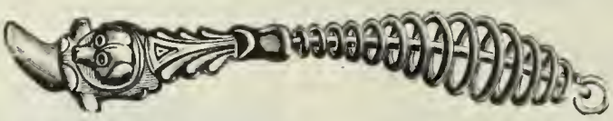
The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

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"Siberian Lifter." Fancy design, nickel plated body malleable iron.

"SIBERIAN" POKER. Either bent or straight ends; length, 20 in.



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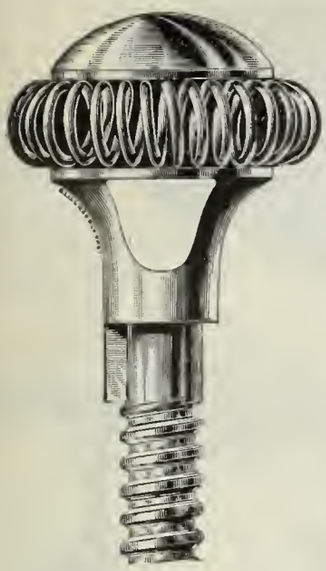
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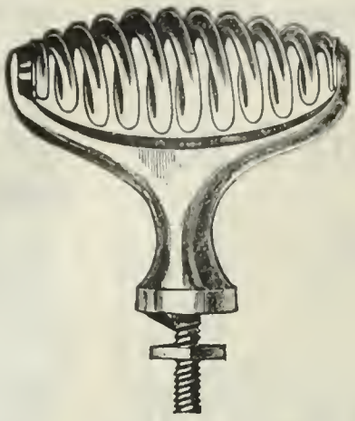
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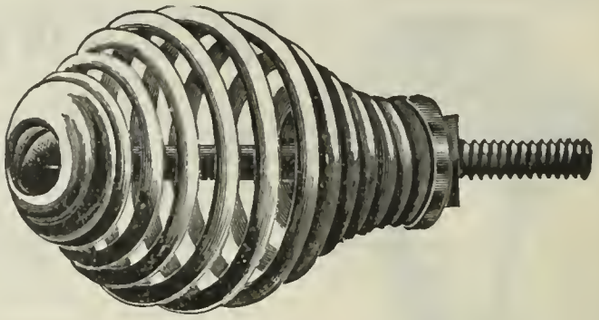
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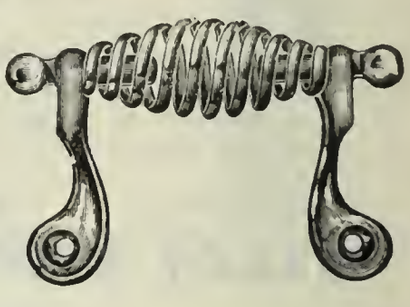
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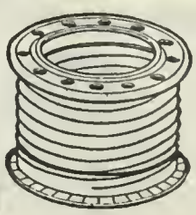
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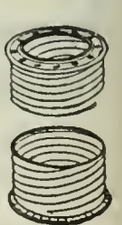
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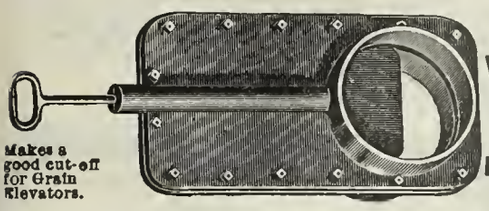
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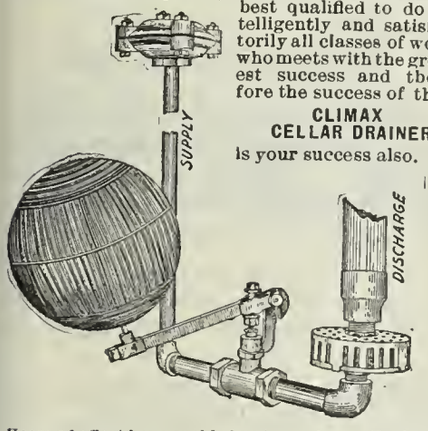
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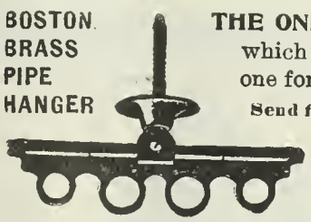


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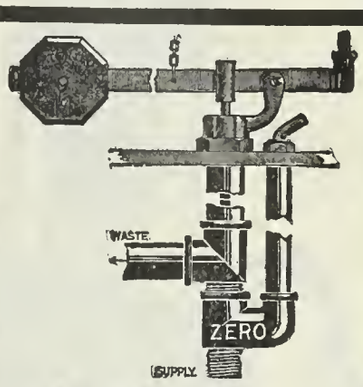
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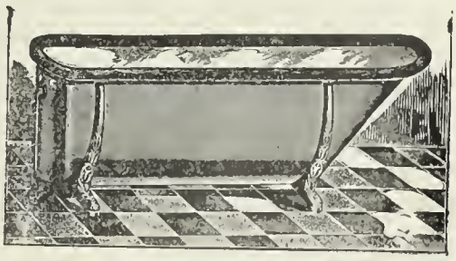
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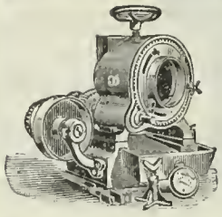
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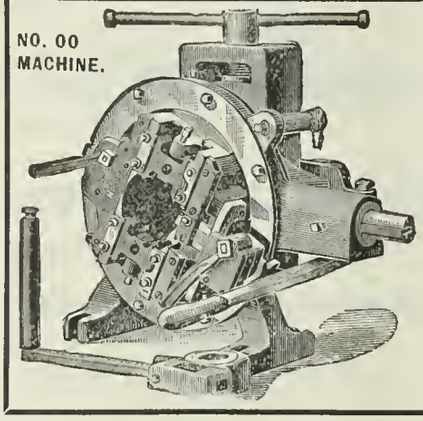


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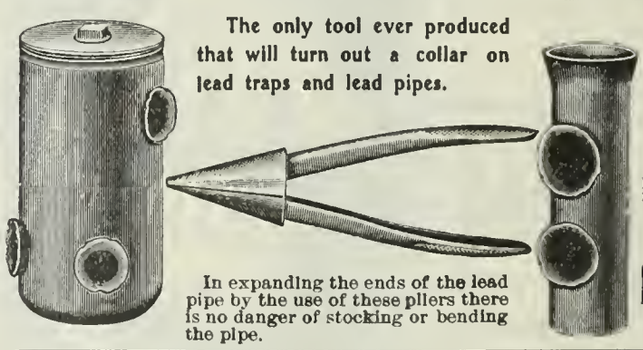
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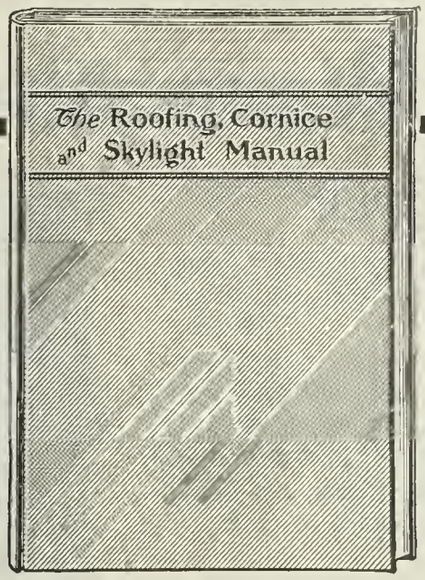
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Tin Roofing Pages 1–50. This section presents an article prepared specially for the book by an expert mechanic. A few of the subjects treated are the laying of flat and standing seam roofing, described in detail, with instructions for flashing around chimneys; connecting roofs with wall flashing; covering parapet walls and bulkheads; putting in valleys; shingle flashing, &c. An important table is given for finding the quantity of tin required for roofs.

Cornice Making Pages 51–140. This part of the volume consists of an article entitled "The Country Cornice Shop," reprinted from *The Metal Worker*, and treating the subject at length. It embraces a description of a shop equipment, such as can be purchased or made, and adapted to the country shop. A few of the subjects treated are the method of developing the patterns for much of the simpler work, as well as for cutting cornice miters; attaching molded gutters to brick walls; the attachment of eave trough to roofs of different kinds; the manufacture of round and square leaders; the making of simpler ornaments, etc.

Skylight Construction Pages 143–175. This division of the work consists of two prize essays reprinted from *The Metal Worker*, giving instructions for the production of skylights of all sizes, the development of hip bar and miters, also curb and side bars. One of these articles describes a skylight without a ventilator, and the other a skylight with a ventilator in the top. The illustrations cover various phases of the work fully and also show the method of catching the condensation which occurs with all skylights.

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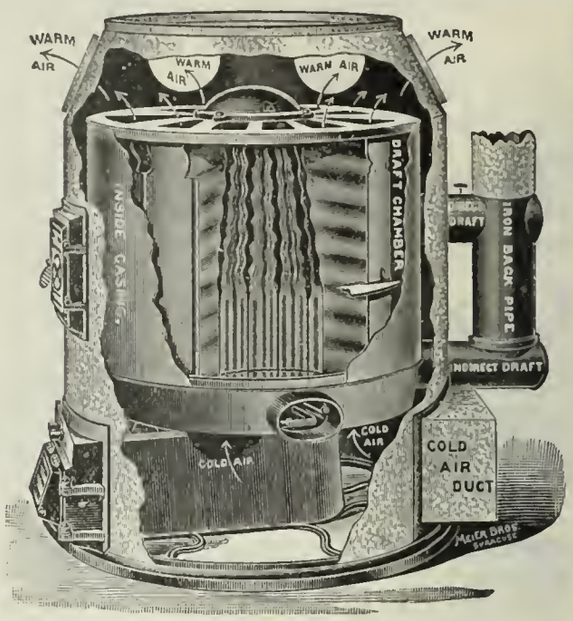
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Each section has eight square feet of heating surface, and weighs about seventy pounds. There are from nine to seventeen sections in each generator, according to its size. This means a powerful and economical heater, and an abundance of pure warm air. Each section is an independent heat generator, and by capping over one or more, and extending a heat-conducting pipe therefrom, the warm air is forced through long or level pipes to the rooms so connected.

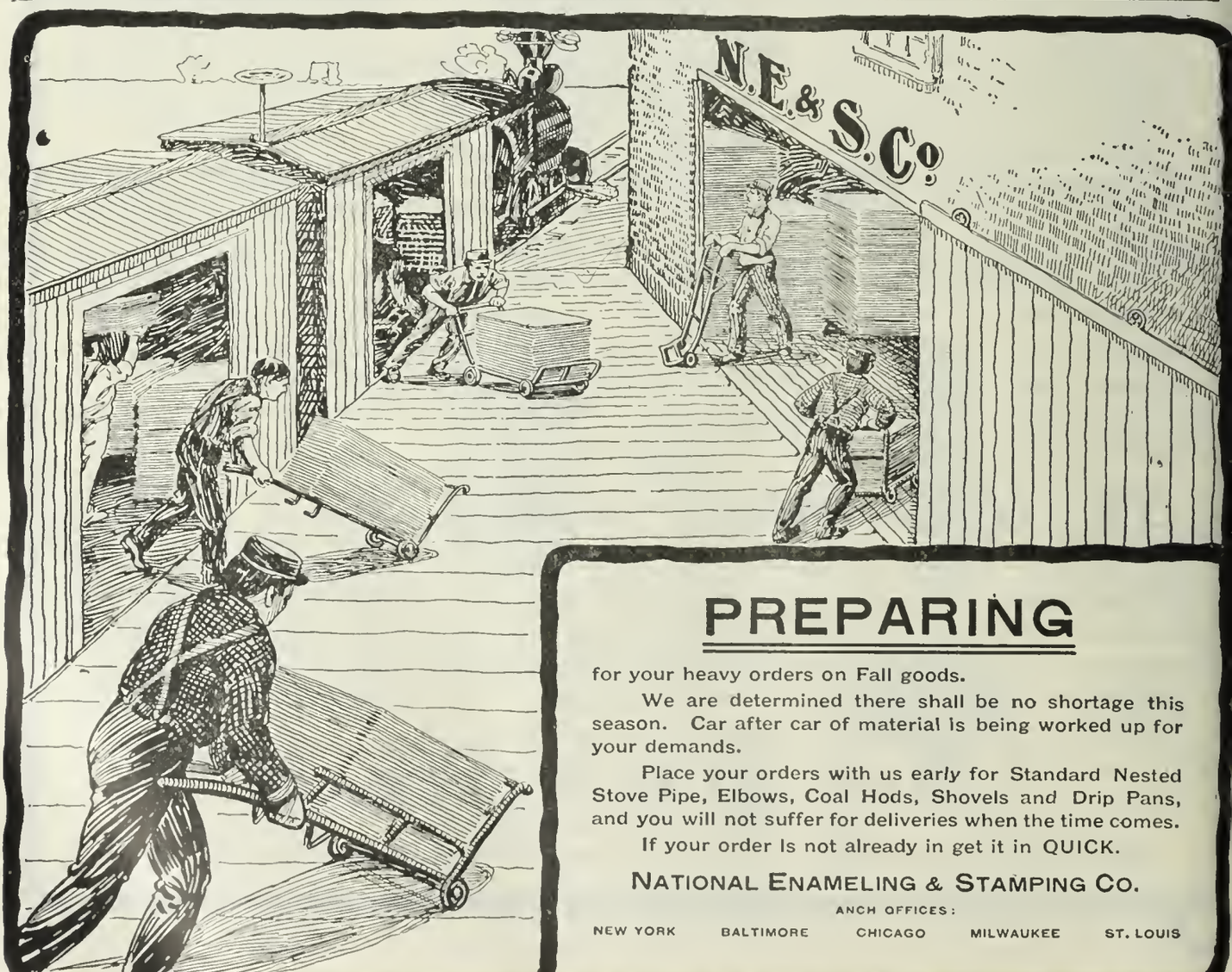
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THE METAL WORKER

NEW YORK AND CHICAGO.

New York, March 29, 1902.

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The Pittsburgh office of *The Metal Worker*, Robert A. Walker, manager, will be removed on April 1 from rooms 509 and 510 Hamilton Building to room 1201 Park Building.

The Labor Outlook.

The whole condition of trade is so satisfactory and the outlook for the future is so extremely encouraging that a long period of prosperity seems assured. But an effective way in which this prosperity can be checked is by a series of labor troubles which will interfere with the operation of factories consuming raw material and converting it into finished products. At present the utmost energy of the forces of production of the entire country is necessary to keep the channels of consumption supplied. It is likely that after the severe experiences of last year the employees in iron and steel works will not soon be disposed to try conclusions with their employers, but will endeavor to pursue their way peacefully and industriously. This view of the situation is justified by the agreements which have already been made for keeping mills in operation during the summer without stopping for the adjustment of the wages schedule for another year. If the same placidity was observed in other parts of the labor field the outlook would indeed be most assuring. Unfortunately there are indications that presage disturbance in the foundry industry. The Iron Molders' Union of North America expect to hold another of their national conventions this year, and it may reasonably be expected that a strong effort will be made to show those who gather in that convention that something is being done by the leaders for the welfare of the rank and file, and this can best be done through a strike of large proportions. The agitation of another strike in the machinists' trade has begun in Chicago, being directly fomented by the president of the International Association of Machinists, who has announced that the movement for a nine-hour day would be renewed on May 1. Looking around still further, it is observed that the coal miners in some of the important Western coal fields, the engineers on lake vessels and other workingmen in many lines are preparing for trouble. The recent events in Boston show how easily an apparently insignificant matter may develop into a most serious condition of affairs. It will take all the time and energy of the Civic Federation and other conciliatory agencies to tranquilize these uneasy forces or to secure a speedy settlement of differences when labor troubles break out. Otherwise, the number of persons finding 1902 a period of prosperity and individual advancement may be heavily reduced.

Preparing for the Conventions.

It has been noted in connection with the recent meetings of the various State associations of master plumbers that the Cleveland Resolutions adopted by the Executive Committee of the National Association of Master Plumbers have been quite generally indorsed. This action would appear to afford evidence that many master plumbers are willing to operate under a set of resolutions from which the arbitration feature has been eliminated and which have not been accepted by the supply trade. On the other hand, well informed men in the trade are of the opinion that the supply trade was never so thoroughly a unit as at the present time in their indorsement of the Chicago Resolutions adopted by the National Committee of the Confederated Supply Associations, which are said to concede less to the master plumbers than was conceded by the New York Resolutions. From this statement of conditions it would seem that unreconcilable conditions existed, but fortunately there are men in both associations who are opposed to any break that would interfere with the general business and welfare of the trade. Some master plumbers have been met by the supply trade in their community, and are trading under an agreement that would be by no means satisfactory to those who prefer the New Orleans Resolution. On the other hand, there are those in the supply trade who would not support any step that would inevitably lead to a trade war, although others are willing should any radical step be taken to advocate an open market on plumbing goods. It remains for the diplomats in both associations to so direct the discussions at their meetings that all points may be fairly thrashed out, with the view of bringing about the conclusion that a mutually agreeable and reasonable arrangement must be effected. There is always enough friction in the transaction of business without inviting the serious trouble that would follow a break in trade relations, and it is earnestly to be hoped that the outcome of the deliberations at Atlantic City will be harmony.

Another Victory for Arbitration.

Evidence is accumulating that the movement for the arbitration of labor disputes initiated by the National Civic Federation a few months ago is meeting with cordial support from both employers and workingmen. Already some gratifying results have been accomplished. The recent settlement of the protracted strike at the plant of the National Cash Register Company, at Dayton, Ohio, is an important achievement that must be placed to the credit of the federation's special Conciliation Committee. The trouble that has now been amicably settled began some nine months ago, when about one hundred union metal polishers employed at the cash register works went out on strike as a protest against the discharge by the management of certain of their fellow employees. In consequence the entire plant was shut down and over 2000 workmen were for a time thrown into idleness. Organized labor regarded the struggle as so important that a boycott was inaugurated, and has been assiduously carried on against the products of the Dayton factory. The dispute remained unsettled

until the Conciliation Committee of the Civic Federation took up the matter, and after two days' conference in New York succeeded in bringing about a satisfactory adjustment. The success that the arbitration movement has already met with in this and one or two other instances promises well for the proposed system of permanent mediation in labor disputes. It is gratifying to note that the efforts now being made to this end are receiving cordial support from the prominent labor leaders of the country and from the more sane and substantial labor organs. It is recognized alike by employers and employed that strikes are expensive and disastrous to both parties, and the feeling is growing that it would be to their mutual advantage to adopt Senator Hanna's advice and join hands in the support of a method whereby these wasteful struggles may be avoided. While it will be useless to look for an early industrial millennium, there are decided indications that a long step is being made toward a better understanding between capital and labor, and this is sufficient ground for congratulation.

The Social Side of Trade.

While the past history of the trades in which our readers are interested records an occasional dinner or meeting arranged mainly for social purposes, it has remained for the social side of their business to reach a fuller development in the past year or two. If cultivation of the social side found justification in the benefits derived from the dinners given in the past by the old Caloric Club of New York City, which was purely a social body, its natural successor, the Carbon Club, has in this way accomplished still more for the general benefit of the trade, and the annual dinner of that society is a feature that is now looked forward to with interest and pleasure. In the West the impromptu golf tournament arranged by the Chicago steam and plumbing supply trade last fall has led to the permanent establishment of the Trade Golf Association in that city, composed entirely of members of the plumbing and steam supply trade. The newest body organized entirely for social enjoyment and relaxation from business is the Plumbing and Steam Supply League, which has just finished a bowling tournament in New York City. A particularly pleasant feature of the league, which is composed of teams representing some fifteen different supply houses in New York and vicinity, was the dinner last Saturday night, at which the prizes were presented to the winners. The frequent meetings of the league this winter have built up friendly connections that probably will last throughout the business career of many of the men. Its influence was sufficiently marked to elicit from those interested a strong expression of hope that the league would be continued and another tournament carried on next fall. Prominent members of New York houses have found pleasure in visiting the bowling alleys when the contests were going on, and not only have many annoying incidents been explained so that confidence was established, but strong friendships have been established which cannot operate otherwise than to the general good of the trade. There is nothing so well calculated to destroy the capacity for harm of the many petty annoyances that arise in the transaction of business as the warm regard fostered by the cultivation of the social side of trade.

Oil vs. Coal for Fuel Purposes.

It would seem a very simple question to ascertain the relative values of oil and coal for commercial fuel purposes, but there is a very great diversity of opinion upon the subject, and the testimony for and against is so contradictory that a verdict cannot be rendered for either. Despite all the elaborately careful experiments made by various governments to fix the value of oil it is not used to any extent by the naval powers, coal still having the preference, notwithstanding all the drawbacks of dirt, space and force required to handle it. It is not the difficulty of getting good fires, or dangers of spontaneous combustion that delay the general use of oil, it is simply that in daily use—oil against coal—those who pay the bills continue to use coal, and to do this there must be a balance in its favor. One foreign steamship company—the Shell Line of England—have declared unhesitatingly for oil after two years' experience in the use of it. One vessel of this line, the "Clam," has run 85,000 miles with oil fuel, and can stow 4,500 tons of it. It is carried in well-holds reaching from the double bottom to the under deck, and the success of the "Clam" has been so marked that there are four other ships building which will each carry 11,500 tons of oil fuel, or for commercial purposes. These vessels, when not needed for oil freight, can have their holds thoroughly disinfected by the admission of live steam, after which they are wiped down and whitewashed, removing every trace of the smell attending petroleum. The Shell Line has been carrying Borneo oil previously, but a portion of the fleet has loaded Texas oil, and a large cargo of it recently arrived in England. It can be delivered there in bulk for a little under $9 a ton of 2,250 pounds, which, as compared with coal, cannot be called cheap. The parties interested in the enterprise point out that oil is relatively much cheaper because it has a higher calorific value and will, therefore, do more work, but as this is the moot point in the controversy of oil vs. coal it does not seem to be a commercial consideration. A great point established, however, is that Texas oil has now an outlet to foreign markets.

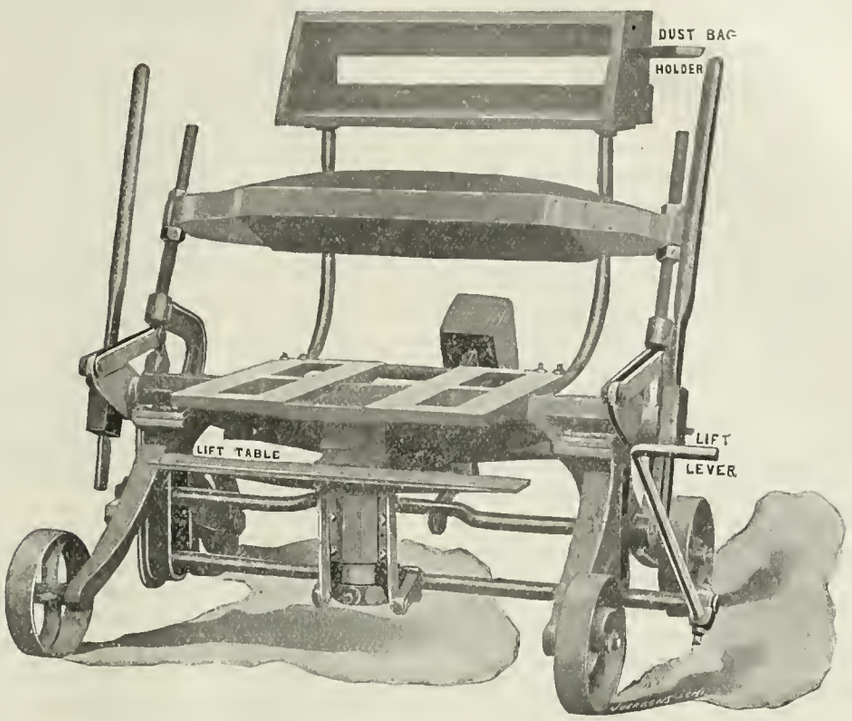
THE AMALGAMATED ASSOCIATION WAGE SCALES.

It is not thought that the Amalgamated Association, at their convention in Wheeling, W. Va., next month, are likely to upset the wage scale agreements entered into between the officials of the association and the American Tin Plate Company, the American Sheet Steel Company and the Republic Iron & Steel Company, whereby provision is made for the uninterrupted operation until July 1, 1903, of the tin plate, sheet and bar iron mills of the companies named. At the same time the possibility exists of a repudiation of the action of their representatives by the Amalgamated Association as a body, and until the matter has been acted upon favorably by the convention the danger of possible labor disturbances in these mills cannot be regarded as positively removed. There is undoubtedly a strong prejudice in some quarters against President Shaffer, and it is just possible that the disaffected element in the association may see fit to work up a sufficiently strong sentiment against that official to enable them to overthrow the agreements made by Shaffer and his associates, with the view of discrediting their work. Those who are well qualified to judge of the matter, however, seem to be of the opinion that the men will recognize the advantages that will accrue to them by the indorsement of the wage agreements and will not allow the gratification of a personal grudge to stand in the way of securing uninterrupted work at the present generous scale of remuneration. It is to be hoped that the convention will see the matter in the right light and ratify the agreements made with the tin plate, sheet and bar makers, especially as those agreements will be binding not only on the companies named, but also on the independent manufacturers having dealings with the Amalgamated Association.

LACK OF PROFITS IN THE GAS STOVE TRADE.

BY G. B.

In reading *The Metal Worker* of February 22 the article on "Lack of Profits in the Gas Stove Trade" attracted my attention because it reflects an experience which exactly fits this district; but I did not know the case was so bad all over the United States. I think the manufacturers of gas stoves should agree not to sell their stoves to any gas company, because it is done at a loss to the regular dealer, and to my mind no one is benefited. Any purchaser of a gas stove would be willing to pay $3 or $4 profit on a stove if it was a good one. When a gas company buy one make of stoves for a city about 20 other makers are shut out of that town, for the reason that all the stoves sold by the gas company are sold at cost, or less than cost, and as the dealers have no opportunity to make a legitimate profit they cannot purchase the gas stoves of other makers. I should very much like to see the gas stove manufacturers combine against this custom of the gas companies. The price of a stove has nothing to do with the selling of gas. If the gas company will sell good gas low enough the people will buy the stoves. As "W. R." says in his article, if it was not for the coal stove business many manufacturers would be driven into bankruptcy, and it is clear that something must be done to remedy this evil. I think the solution is as given above—combine against the gas companies and sell to dealers only.

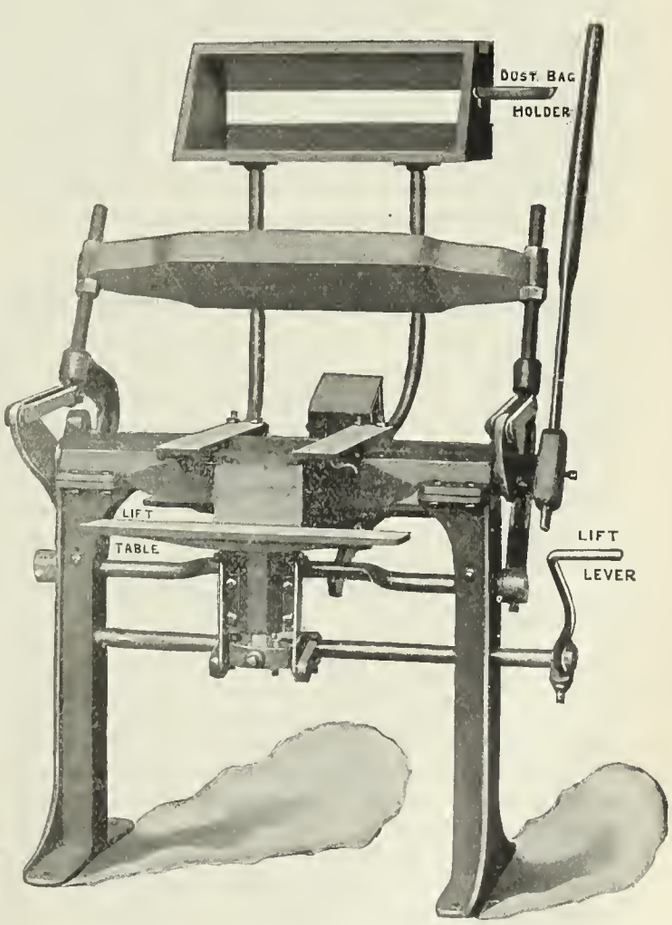


The Farwell Molding Machines.—Portable Machine.

The Farwell Molding Machine.

The accompanying engravings illustrate two types of the Farwell universal molding machine, made by the Adams Company, Dubuque, Iowa. The machine combines the "squeezer" feature of the plain molding presses with the pattern drawing feature. They can be used either with or without stripping plates. When used with the stripping plate, the pattern, which is secured to a frame, rests firmly on the machine table, and the stripping plate rests on the pattern frame. It will be observed, therefore, that both pattern and stripping plate do not rest on the lift table, but are supported by the rigid machine table, where they can well withstand the ramming and pressing of the sand. The stripping plate is supplied with studs that extend down and rest on the lift table. When the lift lever is operated the lift tables are raised, thus raising the stripping plate and drawing the pattern.

When this feature is used without stripping plate it is called the "lift off" method. These patterns, like stripping plate patterns, are necessarily in two sets, one for copes and the other for drags, unless the work is of the symmetrical type and both copes and drags can be made from the same half pattern. The half patterns are secured to a plate. Studs resting on the lift tables extend up and pass loosely through the pattern plate and engage with the flask. When the lift lever is operated



Stationary Machine.

and the lift tables raised the flask is lifted off the pattern.

The stationary machine is 30 inches between the side rods, and the lever is adjustable from 20 to 40 inches. It will take in flasks up to 24 inches in length, 18 inches in width and 10 inches in depth. The portable machine is 38 inches between the side rods, and is adapted to flasks up to 32 inches in length, 18 inches in width and 10 inches in depth.

AID FURNACEMEN.

BY I. E. D.

I am very much pleased to note that *The Metal Worker* of March 15 contains some very pointed letters on furnace work by "S. D.," "S. N. D.," and "H. M. K." If all who do work with hot air furnaces would only contribute their experiences, those who set furnaces could in a year or two have the furnace business up to the high plane where it should be. It does not hurt my feelings to be criticised, for there is not a letter written that could not be remodeled to advantage, so don't let us who read the letters take exception to them and use the valuable columns of *The Metal Worker* for a mere criticism of another's methods. After you have read what a contributor has to say, if you do not like his style of furnace setting, just forget that part of it which does not agree with you, and in order to offset what you consider wrong write for the next issue a letter explaining your ideas, remembering that some who read the paper have not had the same experience that others have. There may be others who would be a great deal more interested in your ideas on setting furnaces than in your criticism of another furnaceman's contributions.

If those who are engaged in furnace work, from the tinsmith to the more experienced man in the office, who does the designing, will study what is presented in *The Metal Worker*, and save these articles for reference, they can, in a few years, have a knowledge of the furnace business that will make them sought when any furnace contractor wants to hire a man. There will be less inquiry as to where a good A1, first-class furnaceman can be had, and only such men are wanted. The first-class furnaceman will then be in demand and will have no difficulty in being properly paid, with satisfaction to himself, his employer and the customers of the house.

Apprenticeship Ratio in the Foundry Trade.

The *Iron Molders' Journal* announces the result of the referendum vote upon four propositions recently submitted to the members of the Iron Molders' Union of North America on the question of apprenticeship. The proposal to change the apprenticeship ratio from 1 to 7 to 1 to 5, with one apprentice for the shop in either case, was defeated by the overwhelming vote of 15,842 against 504 in favor. The proposal to permit members of the Stove Founders' National Defense Association, who cannot after five days' notice obtain a sufficient supply of competent journeymen molders, to increase the number of apprentices to the requirements of their business, where the presidents of the Iron Molders' Union and the S. F. N. D. A. agree that sufficient force is not at hand to do required work, was defeated by almost as large a majority as the first, the vote being 527 in favor and 15,446 against. A third proposition, which provides that molders in S. F. N. D. A. shops shall not be required to work with a helper, or "buck," and that the number of helpers shall not be increased, the object being the ultimate discontinuance of the system, was defeated, 7433 voting in favor and 8148 against. Proposition No. 4, empowering the officers of the union to negotiate an agreement on some other ratio of apprentices than 1 to 5, in case Proposition No. 1 is defeated, was lost, 3978 voting in favor and 12,314 against.

As the result of reorganization of the executive of the Bridge & Beach Mfg. Company, St. Louis, Mo., consequent on the death of George H. Holland, vice-president and manager of the company, the following officers have been elected for the ensuing year: President and treasurer, Hudson E. Bridge; vice-president and manager, Ralph S. Buck; second vice-president and secretary, William McCalpin.

The Furnace Work Record.

It will probably be a very agreeable surprise to some of our readers that we are enabled to present a copy of the Furnace Work Record filled out with the data in reference to the heating of six different buildings. The data presented herewith will doubtless be studied by some furnacemen with considerable interest and will serve to demonstrate to them the value that such a record of their work would prove, as well as to show that it is not such a difficult thing to make the simple calculations necessary to fill out the table. The Furnace Work Record was originally presented simply as a suggestion for the furnace trade to utilize according to their judgment of its value. The hearty indorsement it has received by some men in the trade is evidence that it is of some value, and we have no hesitation in saying that all who use it will be induced to give more careful notice to the many important details bearing on successful furnace heating.

Many furnace manufacturers have expressed themselves as doubtful if many who are engaged in furnace work, or who set but few furnaces during the year, will take the trouble to rule upon a piece of blank paper a chart or record and fill it in. We have already stated in *The Metal Worker* that we have a few enlarged blanks which can be secured by those who might desire to tabulate some of their work. To those who have stated that the average furnaceman could not make the calculations we would say that we think they have underestimated the intelligence of the large majority of men engaged in setting furnaces. Possibly they have a more correct idea of the disposition of furnacemen to go to the trouble of doing this work.

In addition to the records presented herewith, we have received other blanks partially filled in, and should be glad to secure the record of three or four more pieces of work, in order to enable us to present further data. As any good that comes from a better knowledge of how to properly proportion a furnace heating system is beneficial to furnace manufacturers, we are glad to note that many manufacturers encourage the use of the suggestion contained in the Record. We propose to present in due season some of the suggestions for its improvement.

Burners for Gas Stoves.

A patent has been taken out in Great Britain to improve the burners of gas stoves and to render them more durable and efficient. The statement filed in the English Patent Office is as follows: A burner for a gas fire consists of a tube divided longitudinally into an upper and a lower part, the two parts being pressed from sheet metal and secured together by folding their adjoining edges one upon the other. To prevent corrosion the upper part of the burner may be of brass, aluminum or other nonrusting material, or the burners may be enameled, galvanized or treated by any rust preventing process. In some cases, in order to prevent "lighting back," it is proposed to insert between the upper and lower parts of the improved burner one or more layers of wire gauze extending entirely along the burner and dividing the interior space into two parts, the gas being introduced in the lower one.

The American Vapor Stove Company, Detroit, Mich., have amended their articles of association, in order to increase the capital stock of the company from $100,000 to $150,000, by adding $50,000 of preferred stock. This new issue is held by Joseph P. Standart, Herman D. Kallar, Thomas E. Robinson, William F. Metcalf, Edwin J. Mummery, William J. Bert and William J. Hastle.

THE METAL WORKER RECORD OF FURNACE WORK.

If this blank is filled out as shown by the example given below, it will serve as a valuable guide in planning other furnace jobs.

Building Heated.	Grate Surface. Dia / Area.	Heating Surface. Sq. Ft.	Type of Furnace.	Coal Burned per Season. Tons.	Space Heated. Cubic Feet.	Outside Dimensions and Character of Building.	Wall Surface. Square Feet.	Number and Size of Windows.	Glass Surface. Sq. Ft.	Equivalent Glass Surface. The E. G. S. equals the glass surface plus one-quarter of the difference between the wall surface and the glass surface. Square Feet.	Number and Size of Hot Air Pipes.	Area of Hot Air Pipes.	Size and Area of Cold Air Supply. Inside / Outside.	Proportion of Hot Air Pipe Area to Space Heated. Sq. in. to cu ft.	Proportion of Hot Air Pipe Area to Equivalent Glass Surface. Sq. in. to sq ft.	Proportion of Grate Area to Space Heated. Sq. in. to cu. ft.	Proportion of Grate Area to Equivalent Glass Surface. Sq. in. to sq. ft.	Proportion of Grate Area to Heating Surface. Sq. ft. to sq. ft.	Proportion of Heating Surface to Space Heated. Sq. ft. to cu. ft.	Proportion of Heating Surface to Equivalent Glass Surface. Sq. ft. to sq ft.	Temperature at Register.	Temperature of Air Outside.
Reported by W. J. Woodall Connellsville, Pa Store and Residence Stands in a block.	21x41= 861"	90	all steel, brick lined, shallow fire pot		57,000	2-story brick Ceiling 16x10	3020		930	1685	5-10-78 2-14-154 1-16-201	390 308 201 899	Inside 2x15x30= 900	1-63	1 to 1.9	1-66	1-2	1-15	1-633	1-18½	140	0
Reported by W. J. Woodall Connellsville, Pa. Church Isolated in Country	21x36= 756"	75	do		21,000	1-story brick. 28x42x18	2520 420 +2100 525	9-3x9½ 1-2x8 2-6x14 1-8x8 420	420	942	2-18-254	508	Inside 14x18 250 / Outside 12x18 200	1-42	1-1.9	1-30	1-1¼	1-14	1-280	1-12½	140	0
Reported by W. J. Woodall Connellsville, Pa Dwelling Isolated in town.	21x26= 546	50	do		12,000	2-story frame.	2000 200 +1800 450	13-2½x5 2-4x5	200	450 200 650	3-10-78 4-8-50	234 200 434	Outside 14x25= 350	1-30	1-1½	1-24	1-1⅛	1-13½	1-240	1-13	140	0
Reported by M. L. Kaiser Wilkes Barre, Pa. Residence 72 to 74 degrees	18" 254	135	Cast Iron. Vertical flue. Return flue jacket.	From Oct 1 to Apr 1 5	10657	2-story Balloon frame & heathed 9, 8 & 6	+1675 419		212	212 419 631	7 1-12 1-8 2-11 3-10	113 56 190 234 593	16½x36 16½x36 594	1-18	1-1.06	1-42	1-2.5	1-75	1-79	1-4.7	120	0
Reported by M. L. Kaiser Wilkes Barre, Pa Church Adjourning a S. S. at one end.	30" 706	191	do	Less than ½ formerly used	68,816	Auditorium and Balcony	+3700 925	10 4x11	440	440 925 1365	5 16"	1005	27x27 729 30½ 737	1-68	1-1.4	1-97	1-1.9	1-40	1-360	1-7		
Reported by R. C. Carpenter Ithaca, N.Y.	20" 400	Unknown	All cast iron. Indirect draft Inside Casing 287 Carton	9.5	16,004	2-story Wooden House Ceilings. 9ft 8ft	Exposed 1850	11	616	462 616 1078	5-8-50 2-10-78	406	Inside 1x2 ft	1-28.6	1-2.65	1-45	1-218	Furnace heating surface not known.			120 to 160	Zero 7

ODD PLATES.

The J. W. Paxson Company of Philadelphia, manufacturers of Foundry Facings and Supplies, &c., have opened a branch, under the charge of W. Scott Thomas, in the Union Trust Building, Baltimore, Md.

The Cuyahoga Stove Repair Company are building a factory on Union street, Cleveland, Ohio.

The Gobeille Pattern Company, Cleveland, Ohio, announce that Charles H. Meigs, for some time secretary of the company, is no longer connected with them in any capacity.

The Ohio Stove Foundry, Portsmouth, Ohio, will erect an addition to their molding room, 60 x 100 feet, which will give accommodation for 20 additional molders.

The Cleveland Automatic Molding Machine Company have been incorporated with $10,000 capital. George F. Knash, L. A. Ritzman, J. W. Butterfield, J. W. Burrell and W. E. Patterson are the incorporators.

H. A. Perkins has resigned his position with the Brooklyn Firebrick Works, Brooklyn, N. Y., and has associated himself with J. Perkins of Rutland, Vt., under the name of the Newton & Perkins Firebrick Works, Albany, N. Y.

The Eureka Steel Range Company have been incorporated at O'Fallon, Ill., with a capital of $5000, to manufacture Stoves and Ranges. The incorporators are William G. Willard, Augusta Willard and Willard G. Willard, Jr.

The Robinson Furnace Company, 107 Lake street, Chicago, are enjoying a very heavy Furnace trade, which has thus far run considerably in excess of the corresponding period of last year. This business has included practically no large sales, the great volume of small sales showing the generally prosperous conditions prevailing throughout the Furnace trade. They find the demand running very strongly to their Tubular Furnace, which is making a fine record, every season adding to the number of users who are pleased with its efficiency. Robert Robinson of this company is arranging to build a fine residence for himself at Oak Park, one of Chicago's choicest suburbs. This residence will, of course, be heated with a Tubular Furnace.

A convenient little catalogue of the Ranges, Heaters and Grates made by them has been received from Jones & Campbell, Torwood Foundry, Larbert, Stirlingshire, Scotland. The catalogue consists of 60 pages bound in a red cloth cover, and is suitable for vest pocket use, being 2¾ x 5¾ inches in size. In addition to the Stoves and Heaters, the catalogue shows Mantels and a variety of Lavatory Stands and Frames.

James Winfield Foote died from pneumonia at his residence, 181 St. John's place, Brooklyn, N. Y., on Friday, March 21, in the fifty-fifth year of his age. Mr. Foote was the president of the Æolipyle Company, and had become well known to the heating trade through the introduction of the Æolipyle Draft Regulator. He is survived by his widow and one daughter.

The Columbus Stove Company, recently organized with a capital of $50,000 by F. B. Everett, J. W. Hastings, J. C. Campbell, L. E. Jones and B. A. Welling, are rebuilding the old Eagle Foundry, on West Main street, Cincinnati, Ohio, and adapting it for the manufacture of Steel Ranges. The company also propose to do a jobbing business in miscellaneous Castings.

Michael B. McDowell of Altoona, Pa., inventor and manufacturer of the Altoona Hot Air Furnace, died on March 16, aged 64 years.

A neat folder is sent out by the Pennsylvania Stove Company of Ellwood City, Pa., announcing to the trade that they have been organized and are now ready for business. The officers of the company are the following, all of whom were members of the old firm of De Haven & Co.: Lyman W. De Haven, president; John A. Roe, treasurer, and Edwin A. Fisher, sales manager. They are making a full line of Cast Ranges, Cast Cooks, Steel Cooks, Steel Ranges and Heating Stoves of all descriptions.

An auction sale of the stock and chattels of the Chesapeake Stove Company of Baltimore, Md., was held last week on the premises formerly occupied by the company at the corner of Scott and Cross streets. The sale was held on the order of Richard B. Tippett and Emil Budwitz, receivers of the concern. Included in the articles offered for sale was a considerable stock of Stoves, Stove Fittings, Tinners' Tools and other articles. The company's plant was offered for sale at the same time by the auctioneers, but was withdrawn, as no satisfactory bids were received.

The Keystone Foundry & Mfg. Company have been organized by a number of Homestead and McKeesport men who have purchased the plant of the McKeesport Foundry at Versailles, Pa. The plant will be doubled in size and remodeled for the manufacture of Stoves and Ranges. The new concern have a capital of $50,000. H. A. Monath of Homestead is the president, and M. F. Fisher of Hays secretary and treasurer.

A special meeting of the stockholders of the Reading Stove Company of Reading, Pa., will be held on May 15, when a proposition to increase the capital stock of the company from $400,000 to $600,000 and to issue preferred stock for the increase will be considered.

The Progress Furnace & Stove Company of Springfield, Ohio, whose plant was recently destroyed by fire, have leased the Mark Smith factory in that city, formerly occupied by the Rogers Iron Company.

J. C. Parmerlee of Sedalia, Mo., the inventor of the Parmerlee Down Draft Heating Stove, is contemplating the establishment in Sedalia of a plant to manufacture his invention, provided he is able to secure sufficient backing from local capitalists.

The March-Brownback Stove Company of Pottstown, Pa., held their annual meeting in the company's office in that city last week, when the present directors were re-elected, as follows: Franklin March, T. J. March, A. K. Shaner, James Brownback, Dr. J. E. Porter, Mifflin W. Baily and James Rodgers. The Board of Directors re-elected the old officers, as follows: President, Franklin March; vice-president, James Rodgers; treasurer, T. J. March; secretary, Horace M. Ebert. It was decided to authorize the Board of Directors to sell the property of the company located at Parkerford, and to sell or lease their plant at Linfield, as the board deemed best.

The United States Register Company, Limited, Battle Creek, Mich., have issued a neat 16-page pamphlet in the interests of the Jones Side Wall Warm Air Register, of which they are the manufacturers. This Register was recently illustrated and described in our columns. It is characterized as a combination of a Register, Register Border, Double Register Box, Deflector and Foot Warmer, which is patented by the inventor, A. O. Jones. The pamphlet contains a number of flattering testimonials from those who have used this Register. It also gives a price-list and tables of sizes and dimensions, together with a complete description of the device.

No less than 52 buildings of private ownership in New York City are assessed for 1902 at a valuation of $1,000,000 or more. Two of these are assessed at over $6,000,000, one at $4,700,000, four at $3,000,000, ten at $2,000,000 to $2,800,000 and the rest at from $1,000,000 to $1,800,000. Most of these are large down town office buildings, but hotels and large apartment houses also figure in the roll.

At the bi-monthly adjustment of the bar iron scale, held at Youngstown, Ohio last week, no change in the present wages paid the members was authorized. At the present rate puddlers are receiving $5.75 per ton. It is probable that for the months of May and June the men will receive an advance, however, owing to recent advances in the price of bar iron.

NATIONAL RETAIL HARDWARE DEALERS' ASSOCIATION.

The third annual meeting of the National Retail Hardware Dealers' Association was held in the Palmer House, Chicago, on Wednesday and Thursday of last week, March 19 and 20. The following delegates from the various State associations affiliated with the National organization were present:

ARKANSAS: John M. Pittman, Prescott.
ILLINOIS: H. G. Cormick, Centralia; L. H. Clark, Rockford; Z. T. Miller, Bloomington; William T. Gormley, Chicago.
INDIANA: W. P. Lewis, New Albany; M. L. Corey, Argos; Irving A. Sibley, South Bend; Sharon E. Jones, Richmond; H. Burkert, Gosport.
IOWA: W. A McIntire, Ottumwa; W. H. Keating, Ottumwa; H. A. Cole, Council Bluffs.
KENTUCKY: Paul Wagner, Louisville; Joseph C. Kirchdorfer, Louisville; J. C. Frederick, Owensboro.
MICHIGAN: Geo. W. Hubbard, Flint; Henry C. Weber, Detroit; Charles F. Bock, Battle Creek.
MINNESOTA: W. H. Tomlinson, Le Sueur; Charles F. Ladner, St. Cloud; J. F. McGuire, St. Paul.
MISSOURI: Fred. Neudorff, St. Joseph.
NORTH DAKOTA: H. N. Joy, Hamilton; C. N. Barnes, Grand Forks.
OHIO: W. P. Bogardus, Mt. Vernon; George M. Gray, Coshocton; Frank A. Powers, Norwalk.
WISCONSIN: O. P. Schlafer, Appleton; C. A. Peck, Berlin.

At the opening of the session on Wednesday morning, President W. P. Lewis read his annual report, which showed that five States—Arkansas, Pennsylvania, Wisconsin, Ohio and Minnesota—with a total membership of about 1100 had joined the National Association during the year, making together with the membership of the eight original States in the association a total membership in the national body of 2600 members.

Secretary M. L. Corey read his annual report, in which details were given of the work done during the year, and specific mention was made of the progress accomplished in securing correction of some of the troubles which beset the retail merchants.

The president announced the appointment of the following committees:

CONSTITUTION AND BY-LAWS: W. H. Tomlinson, Minnesota; Fred. Neudorff, Missouri; F. A. Powers, Ohio; Paul Wagner, Kentucky; John M. Pittman, Arkansas.
RESOLUTIONS: C. A. Peck, Wisconsin; W. A. McIntire, Iowa; W. P. Bogardus, Ohio; Charles F. Bock, Michigan; C. N. Barnes, North Dakota.
NOMINATIONS OF OFFICERS: Sharon E. Jones, Indiana; O. P. Schlafer, Wisconsin; H. N. Joy, North Dakota; Jos. C. Kirchdorfer, Kentucky.
PRESS: Z. T. Miller, Illinois; H. G. Cormick, Illinois.
AUDITING: Irving A. Sibley, Indiana; H. A. Cole, Iowa.

On Wednesday afternoon Treasurer H. C. Cormick presented his report, which showed the association to have discharged the indebtedness carried over from the preceding year and to have sufficient balance to cover current expenses. The convention then proceeded to a discussion of the various subjects connected with the annual report. It was decided to issue an annual manual, and the decision was also made that a national fire association should be organized in connection with the work of the association. The question of the payment of a salary to the president, treasurer and secretary was referred to the Executive Committee.

The greater part of the session on Thursday morning was consumed in the general discussion of subjects of immediate interest to the association, involving questions relating to the constitution and by-laws, and the relations of the various trade elements to each other. No action in this line was taken which is of public interest. A vote of thanks was tendered to the officers who had so ably and efficiently served the association during the past year.

A pleasant feature of the afternoon session was the presentation made to President Lewis by Mr. Cormick of the contents of an envelope, to be given by Mr. Lewis to his bride for the purchase of a memento of the kindly feeling entertained for President Lewis by his fellow members of the association. The presentation was acknowledged by Mr. Lewis in feeling terms.

The secretary reported that the Committee on Nominations had made the following nominations:

For president, H. G. Cormick, Centralia, Ill.

For vice-president, C. N. Barnes, Grand Forks, N. D.

On motion, the secretary was instructed to cast a ballot for the gentlemen nominated, who were declared elected. The secretary then read the nomination of members to act as the Executive Committee for the ensuing year, and on motion the following were unanimously elected:

W. P. Bogardus, Mt. Vernon, Ohio.
O. P. Schlafer, Appleton, Wis.
C. F. Ladner, St. Cloud, Minn.
W. A. McIntire, Ottumwa, Iowa.
Sharon E. Jones, Richmond, Ind.

Other matters of interest were then discussed, and at the close of the session President Cormick made an interesting address, after which the convention adjourned, subject to the call of the Executive Committee. At the conclusion of the convention the Executive Committee met and re-elected M. L. Corey of Argos, Ind., secretary, and selected W. P. Bogardus, Mt. Vernon, Ohio, as treasurer for the ensuing year.

On Wednesday evening the delegates in attendance at the convention enjoyed a banquet at the new Hardware and Manufacturers' Club, which was tendered them by W. H. Bennett of the Reading Hardware Company; D. W. Simpson of the Wilcox Mfg. Company, and J. D. Warren of the J. D. Warren Mfg. Company. A feature of the banquet was the complete absence of wine, which was the subject of approving remarks by the guests After coffee and cigars, Mr. Bennett assumed the role of toastmaster, and called upon a number of those present for remarks.

Among those who responded to his call were: D. W. Simpson, Ex-President Lewis, Irving A. Sibley, H. G. Cormick, M. L Corey, C. A. Bock, H. N. Joy, W. A. McIntire, W. H. Tomlinson, W. P. Bogardus, H. H. Roberts, S. T. Johnston, C. A. Peck, Paul Wagner, J. F. McGuire, W. T. Gormley, John M. Pittman, S. E. Jones and Geo. W. Cope. The speeches made by the delegates were unusually bright and entertaining, and the banquet room was not deserted until a late hour.

The Proposed Consolidation of Hardware Jobbers.

There have been many rumors during the week in regard to the proposed consolidation of jobbing interests, and constant conferences, at which many prominent houses were represented, have been held in this city. Reports have been given currency in the daily press that the leading houses in the trade are to be parties to the movement, but it is impossible to ascertain what foundation there is for such rumors, as the houses do not confirm or deny the reports. It is understood that this is a critical time for the project, as options expire April 1, so that if anything is done it must be done without delay. Those active in the matter express the utmost confidence that the effort will be successfully consummated, but in what form it will be no intimation is given.

Aluminum Cooking Utensils.

The Aluminum Cooking Utensil Company, Pittsburgh, Pa., of whom Dr. Charles E. Zeigler is the general manager and J. H. Wilson general sales agent, have issued a new illustrated catalogue of the aluminum cooking utensils which they are manufacturing. The catalogue is a 32-page publication, gotten up in tasteful style, the letterpress being in two colors and the illustrations consisting of excellent half-tone reproductions of the various goods manufactured by the concern, who claim to make the largest and most complete line of aluminum cooking utensils in the country. In an introductory note the advantages of aluminum for household ware are set forth at length, and the statement is made that whereas in the early experimental days of the metal some vessels were made so thin that they became dented and were easily damaged, the Aluminum Cooking Utensil Company are now making their wares of the necessary thickness to enable them to withstand all the vicissitudes of wear and use. Among the goods shown in the catalogue are Handy kettle steamers, Handy saucepans, lipped saucepans, Berlin saucepans, preserving kettles, Wind-

sor kettles, double boilers, tea kettles, waffle molds, odorless frying pans and griddles, pudding and cake pans, cake molds, muffin pans, lemonade shakers, tea steepers, wash basins, trays, funnels, plates, dinner pails and cuspidors; also the patent Ideal percolating coffee pot and the Matchless coffee pot, which are specialties of the concern. The Aluminum Cooking Utensil Company are a branch of the United States Aluminum Company. Their factory is equipped with the latest improved machinery specially adapted for the manufacture of this class of goods. The company are making special efforts to produce the highest possible grade of ware.

Stand for Covers.

In the store of Hale & Kelsey, Middletown, Conn., is a home made stand for holding covers, as shown in Fig. 1. A 1-inch base board, 17 inches square, rests on the narrow sides of two 2 x 4 joists. From the

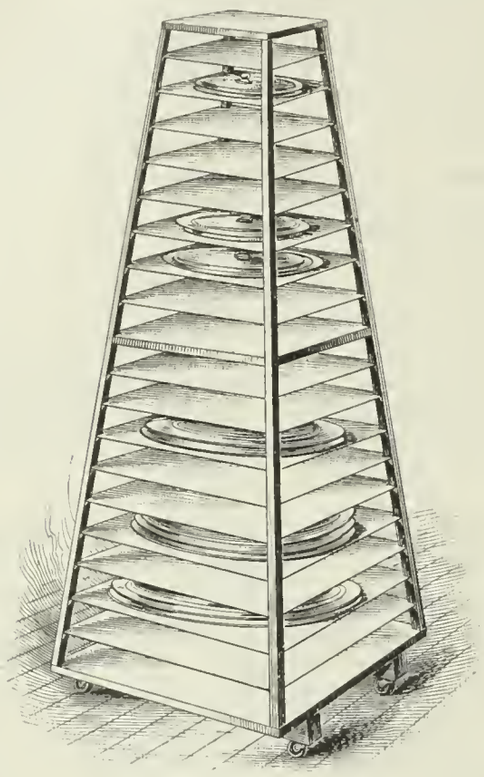


Fig. 1.—Stand for Covers.

corners of this base board are erected two corner posts, 1 inch square, which step in a top board of 1-inch stuff measuring 11 inches square. About half way from the bottom board to the top board is placed a ½-inch wooden shelf to stiffen the construction. At intervals of about 3 inches between this and between the top and

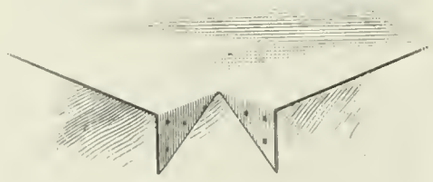


Fig. 2.—Construction of the Corners of Shelves.

bottom boards are placed 16 shelves made of tin plate. The edges are turned and flattened down. Then a short cut is made in each corner on the diagonals and the corners are bent down as shown in Fig. 2. The sheets are then tacked to the uprights through the bent down surfaces, completing a useful and inexpensive piece of store furniture.

Mueller & Brown have just opened up in Shelf Hardware, Farm Implement, Stove and Paint business in Abilene, Texas, and would be glad to receive catalogues, price-lists, &c., relating thereto. Mr. Brown was formerly in the same line at Munfordville, Ky.

Galvanized Oily Waste Can.

The Steel Basket Company, Cedar Rapids, Iowa, have added to their galvanized specialties the oily waste can which is herewith illustrated. The can is corrugated, and has a riveted double bottom raised 4 inches from the floor. It is provided with a self closing metal cover, and is offered to the trade as a thoroughly safe receptacle for oily rags and waste, which are of a highly in-

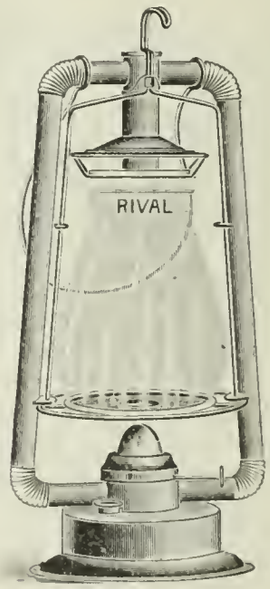


Galvanized Oily Waste Can.

flammable character. The can is regularly made in six sizes, but other sizes can be furnished to order. The company are making corrugated galvanized cans, pails and baskets. Their baskets are now made with a double bottom, strongly riveted all round, having no straps or rough places to injure clothing or shoulders.

Rival Tin Tubular Lantern.

The Berger Mfg. Company, Canton, Ohio, are the makers of the Rival tin tubular lantern, here illustrated. It is made for ⅝ and 1 inch wicks, as here shown, also with plain and bull's eye globes for dashboards.



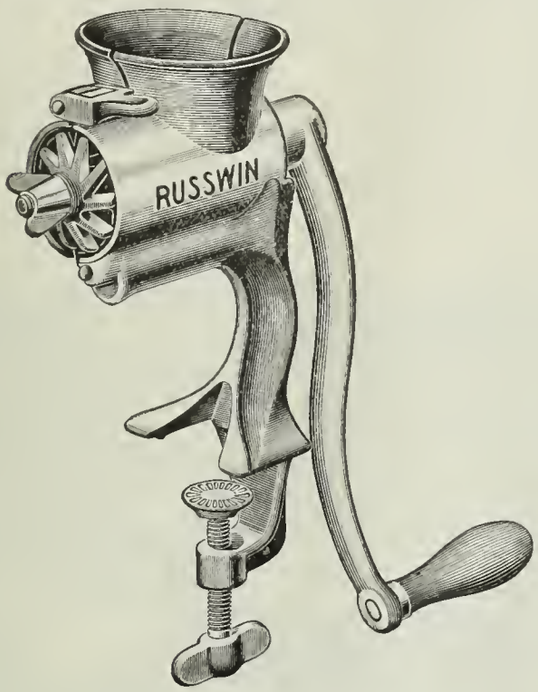
Rival Tin Tubular Lantern.

It has a locked burner, simple top lift, patent one-piece crimped tubes and retinned, tested founts. The regular size is packed one dozen in a case, weighing, ready for shipment, 36 pounds.

The next annual meeting of the Texas Hardware Jobbers' Association will be held in Fort Worth, April 21 and 22. The headquarters will be at the Worth Hotel.

Russwin Food Cutter.

Russell & Erwin Mfg. Company, New Britain, Conn., and 43-47 Chambers street, New York, have just begun the manufacture of the Russwin food cutter, here illustrated. This food cutter is made in two sizes, Nos. 1 and 2, for family use, the No. 2 being the larger of the two. Four cutters in all are furnished, three of which are similar to the one seen in the illustration, except that they vary as to product, fine, medium and coarse, the remaining cutter being of a different character for grinding nuts into a pastelike mass or butter. This cutter is



Russwin Food Cutter.

practically in two parts; the worm screw and cutter and the hinged shell, held together at the top by a pivoted loop. There is a gutter underneath a part of one shell to catch juice of meat, fruit or vegetables and conduct it so as to drop with the cut material into the receptacle used for that purpose. The cutter can be opened instantly and cleaned quickly. It stands well above the table and permits of the use of a large dish. It is self sharpening, and is said not to squeeze the material treated, but actually cuts it. The cutter is tinned, and can be readily attached to table or shelf.

Standard Spray Pump.

The Admiral Lamp Company, Marysville, Ohio, are manufacturing the Standard spray pump, here shown, Fig. 1 illustrating the pump as in use and Fig. 2 being a



Fig. 1.—Standard Spray Pump.

sectional view of the working parts. The pump is made entirely of brass, with two solid brass ball valves, and is 27 inches long. There are no leathers, washers or suckers, or castings to rust and produce leaking joints. It can be used with bucket, knapsack, tank or barrel for spraying orchards, gardens and vineyards; also for whitewashing, disinfecting chicken houses and extinguishing small fires. With the pump are provided two



Fig. 2.—Sectional View of Working Parts.

interchangeable nozzles, No. 1 throwing a solid stream 50 to 60 feet. No. 2 attached to No. 1 throws a fine spray 28 feet, while No. 2 attached direct to the pump throws a coarser spray 40 feet. The company can also furnish a kerosene attachment, which is so constructed that the quantity of oil used can be instantaneously adjusted.

Stove and Hardware Dealers.

JOHN KERR has bought the Hardware, Stove and Sporting Goods business of Weiner & Link, Burt, Iowa.

ED. C. WHITLOCK has purchased a stock of Hardware at Kinross, Iowa, and will also handle Stoves, Bicycles, Pumps, &c., operating a tin shop for roofing and general repairing. He desires catalogues and price-lists.

ANNOUNCEMENT is made that the twelfth annual convention of the Southern Hardware Jobbers' Association will be held at Atlantic City, N. J., June 17-20 next.

B. L. SPOFFORD, Wareham, Mass., has opened a store at 876 Main street, Coburn Block, and will deal in Hardware, Paints, Oils, Crockery, Tinware and Lamps.

THE ELECTRIC CHAIN COMPANY, Attleboro, Mass., who manufacture small Chain for jewelers' use, have recently extended their line and are finding a market for some of their product among manufacturers. They are producing Brass and Iron Chain by machinery from wire of from 21-1000 to 57-1000 gauge. This Chain is produced by special machinery under a new process and it is claimed to be the strongest unsoldered Wire Chain made. They have a variety of styles and are prepared to make special Chain to order.

THE ANDREW B. HENDRYX COMPANY, New Haven, Conn., have just issued their illustrated catalogue, which is bound in red leather, gilt edged and divided into three sections, with a separate index for each. The first 175 pages describe a large line of Bird and Animal Cages, Cage Specialties and the following styles of Chain—viz., Curb, Safe, Ladder, Plumbers', Safety and Single and Double Chains made variously of bronze, brass and iron. The next section, paged 1 to 111, treats exclusively of Fishing Tackle Reels, and is separately indexed. The balance of the book, pages 112 to 192, inclusive, relates to Spoon Baits, Fly Spoons and Feather Hooks in great variety.

GEORGE WILLIAM HOFFMAN, 295 East Washington street, Indianapolis, Ind., is sending out a circular inclosing in a small tin box a sample of Hoffman's Infallible U. S. Metal Polish Paste, which is adapted for cleaning and removing the tarnish from all kinds of metal goods, from fine silver to tinware and machinery mountings.

THE TOWER MFG. COMPANY, Madison, Ind., have added to their former line of Tacks, Nails, Staples, &c., Coopers' and Tinners' Rivets and Coppered and Tinned Belt Rivets and Burrs and Washers. They have also lately put on the market two very attractive packages of Carpet Tacks under the names of Excelsior and Pan-American Tacks. All of the above, together with their former line, are shown in a new catalogue recently issued by the company.

THE FISCHER-LEAF COMPANY of Louisville, Ky., manufacturers of Mantels and dealers in Stoves and Ranges, announce that they have sold their retail business at 433 to 435 West Jefferson street to the new firm of Brecher & Buck, who will move their offices to their factory at Sixteenth and High streets, Louisville. The new firm are composed of C. P. Brecher, formerly vice-president of the Fischer-Leaf Company, and G. W. Buck.

THE new galvanizing plant of the Lalance & Grosjean Mfg. Company at Woodhaven, L. I., is approaching completion, and it is expected to be in operation early next month.

THE auction sale of Enameled Ware in New York City last week attracted the largest attendance of dealers from all parts of the country that has ever been known on a similar occasion. The bidding was exceedingly brisk and the prices obtained are said to have been entirely satisfactory.

D. S. ROMINE has bought the Hardware, Stove and Agricultural Implement business of La Baw & Co., Bartlett, Kan.

THE BEST STOVE COMPANY is the title of the new firm who have taken over the retail Stove and Tinware business of George Stethem, at Peterborough, Ont., Canada. E. M. Best, formerly of Woodstock, Ont., is the head of the new concern.

THE HEATING AND VENTILATION OF THE EDWARD WYMAN SCHOOL, ST. LOUIS, MO.*

BY ALVIN D. REED.

That the proper heating and ventilation of modern schools is a matter of more than ordinary importance is well known to all members of this society, and as there are in school houses many special features of great importance in the construction of the building, such as the arrangement of rooms and wardrobes, light, stairways, &c., which prevent the planning and erection of an ideal system, the designer is frequently called upon to exercise considerable ingenuity in planning a system which, when completed, will not only give entire satisfaction to his clients, but be entirely satisfactory to himself.

It has been my custom to keep in very close touch with the drafting room when the planning of a new school or the reconstruction of an old building is commenced; and, in fact, the matter of heating and ventilating is always kept in mind at all stages and progress of the work. By this method a very much better system is planned than if no attention was given the heating and ventilation until all plans were finished.

In all new buildings, and when old buildings are to be reconstructed, arrangements are made to heat and ventilate by the low pressure steam and fan system. By low pressure I mean that not more than 15 pounds of steam is carried on the boiler, and lower pressure on the heating system maintained through reducing valves.

One of our latest buildings, the Edward Wyman School, two stories high, is shown in Fig. 1, with the greater part of the basement floor being above the grade level. This building contains 18 class rooms, a kindergarten and lecture room (each equal to two class rooms in area), a library, principal's office, teachers' rooms, toilet rooms, &c.

In the basement, shown in Fig. 2, are the boiler and coal rooms, the engine and fan room, the latrine rooms, and play rooms.

Each class room, as shown in Fig. 3, is provided with ample wardrobe room, and these rooms are arranged to receive outside light. The wardrobes differ from those of the ordinary school building inasmuch as they open off of the room only, having no communication with the corridors.

The building is of fire proof construction throughout. It is designed after the early English style, and the feeling has been admirably maintained by the use of a mottled brick with heavy gray joints. The building is finished in hard wood throughout, and the walls and ceilings are painted in lead and oil in pleasing and harmonious colors.

Total cost of finished building, $126,752. Cost of heating and ventilating only, $10,687.

The heating and ventilating plant consists of one horizontal tubular boiler, 72 inches in diameter, 22 feet long, containing 26 6-inch flues. The engine has cylinder 18 inches in diameter by 12-inch stroke, direct connected to the shaft of the fan wheel. The fan wheel is 11 feet in diameter by 5 feet 6 inches wide; and, as shown by plan and elevation in Fig. 4, is somewhat different from the general method of constructing double discharge fans.

It has been designed to give an even flow of air over the entire surface of the coils, and will be required to deliver 68,400 cubic feet of air per minute in order to comply with the guarantee. The heating of the air is accomplished by 12 coils, two coils being used as tempering coils, and five coils used in each heater stack. Each coil has four rows of 1-inch pipe. The pipes are spaced 3⅛ inches center to center lengthwise of the coil, and the rows are spaced 2½ inches center to center. The pipes are 7 feet high, or each coil has 1022 feet of 1-inch pipe; and the 12 coils have 12,264 feet of 1-inch pipe. The heaters and their connections are shown in Fig. 5.



The Heating and Ventilation of the Edward Wyman School.—Fig 1.—General View of the Building.

The base of the coil has been designed with a view of causing the steam and water of condensation to flow in the same direction in the base, and with a seal of water of 1½ inches at rear end, a current of steam upward in two of the rows of pipe, and downward, as it were, in the other two rows of pipe.

During the past winter a test of the coils has proved that they do not air bind. The water of condensation is drained out of the bottom of the base as shown, giving a dry base at all times, and is returned by gravity to a receiver, when it is pumped to the boiler.

At this school the air is drawn down through the two towers at each side of the main entrance, as shown in Fig. 1, thence through a passageway, when it passes

* Paper read at the semiannual meeting of the American Society of Heating and Ventilating Engineers, at Chicago, July 12, 1901.

either through or beneath the tempering coils. Under each of the tempering coils is placed a by-pass door which is caused to be opened or closed by a thermostat placed in the tempered air room to keep the temperature of the air when it enters the fan at 70 degrees.

rooms. The ducts leading to the class rooms have an area of 2 square feet; the vertical flues an area of 3 square feet; and the openings into the class rooms an area of 5 square feet.

A diffuser, shown in Fig. 5, is used on all fresh air

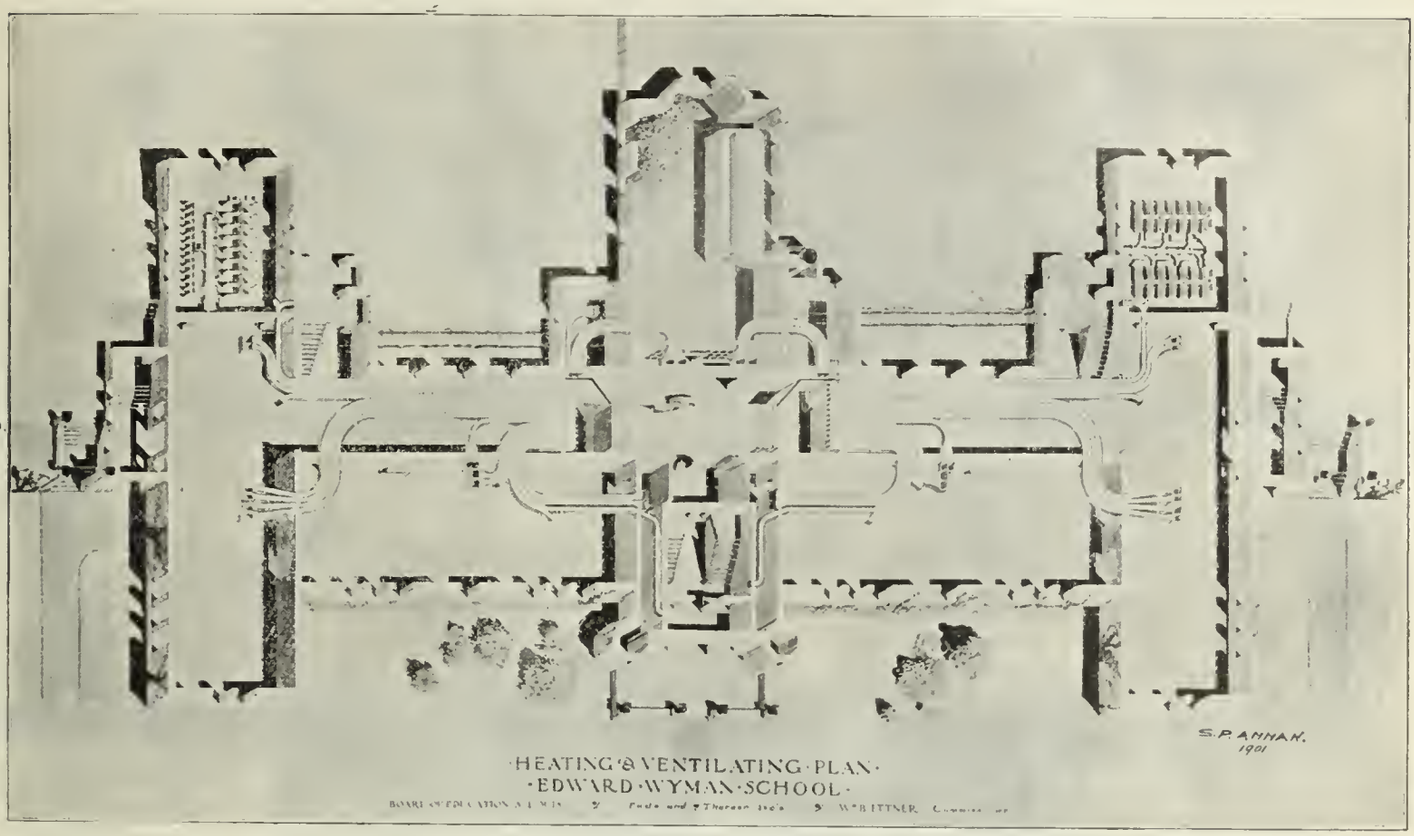


Fig. 2.—Basement Plan.

The air is then discharged from either end of the fan, either through or beneath the heating coils and into the hot room or the tempered air room, and thence into gal-

openings into the class rooms. These openings are located about 9 feet above the floor and, wherever possible in the planning of the building, arrangements are made

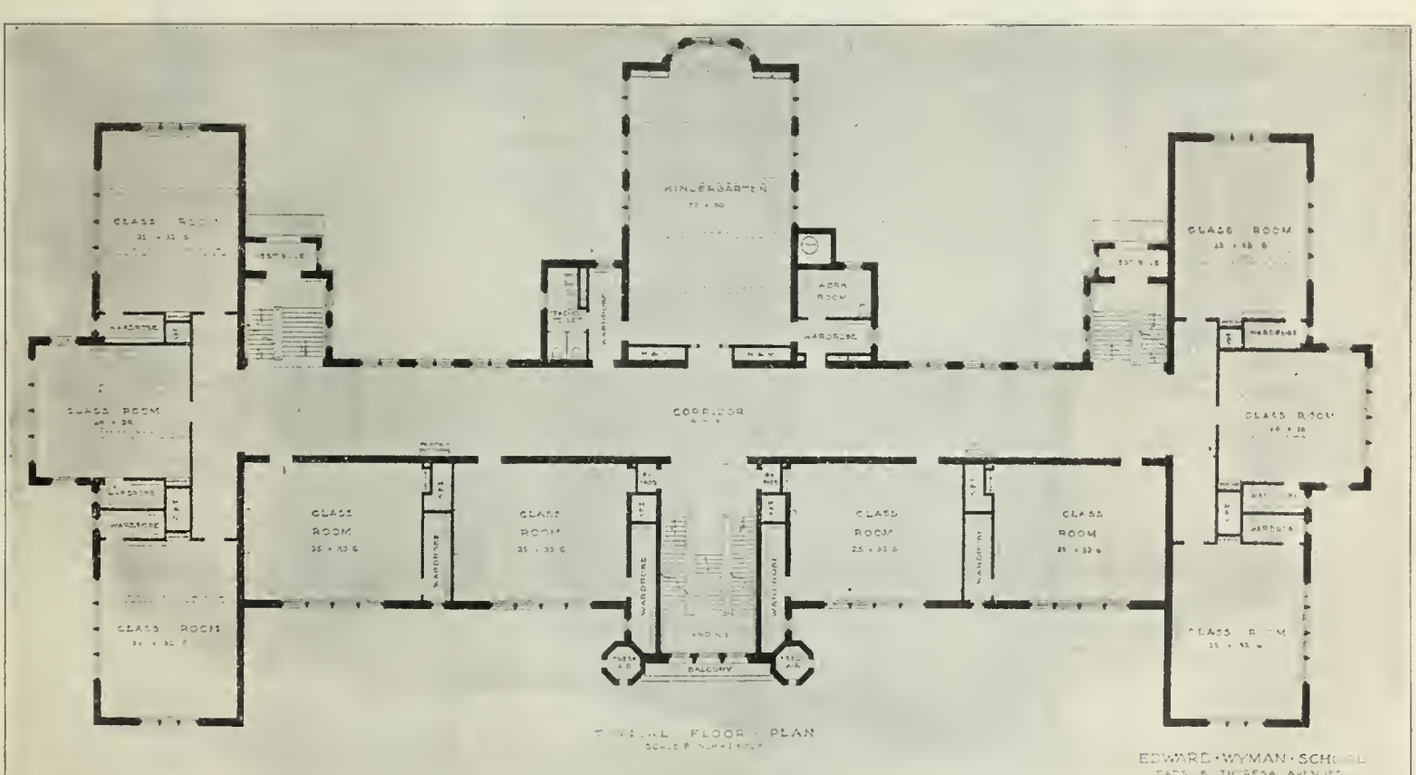


Fig. 3.—Plan of Different Floors.

vanized ducts hung near the ceiling, shown in Fig. 6, leading to each class room.

All class rooms have double connections at the plenum chamber, and these double dampers are controlled by thermostats placed in each of the class

to discharge the air toward the outer walls and glass surfaces; but, as was mentioned early in this paper, this cannot always be done, and under these circumstances a diffuser is found to be of great value in directing the air toward the outer and therefore colder parts of the

room. All vent registers have an area of 5 square feet and are in the wardrobes at or near the floor level. This is found to give a very excellent service.

The wraps of the children are hung on long hooks

This method of opening and closing the doors in the attic has its merits, as ropes, chains and pulleys will get out of working order; and under these circumstances it would be necessary that the janitor, in properly at-

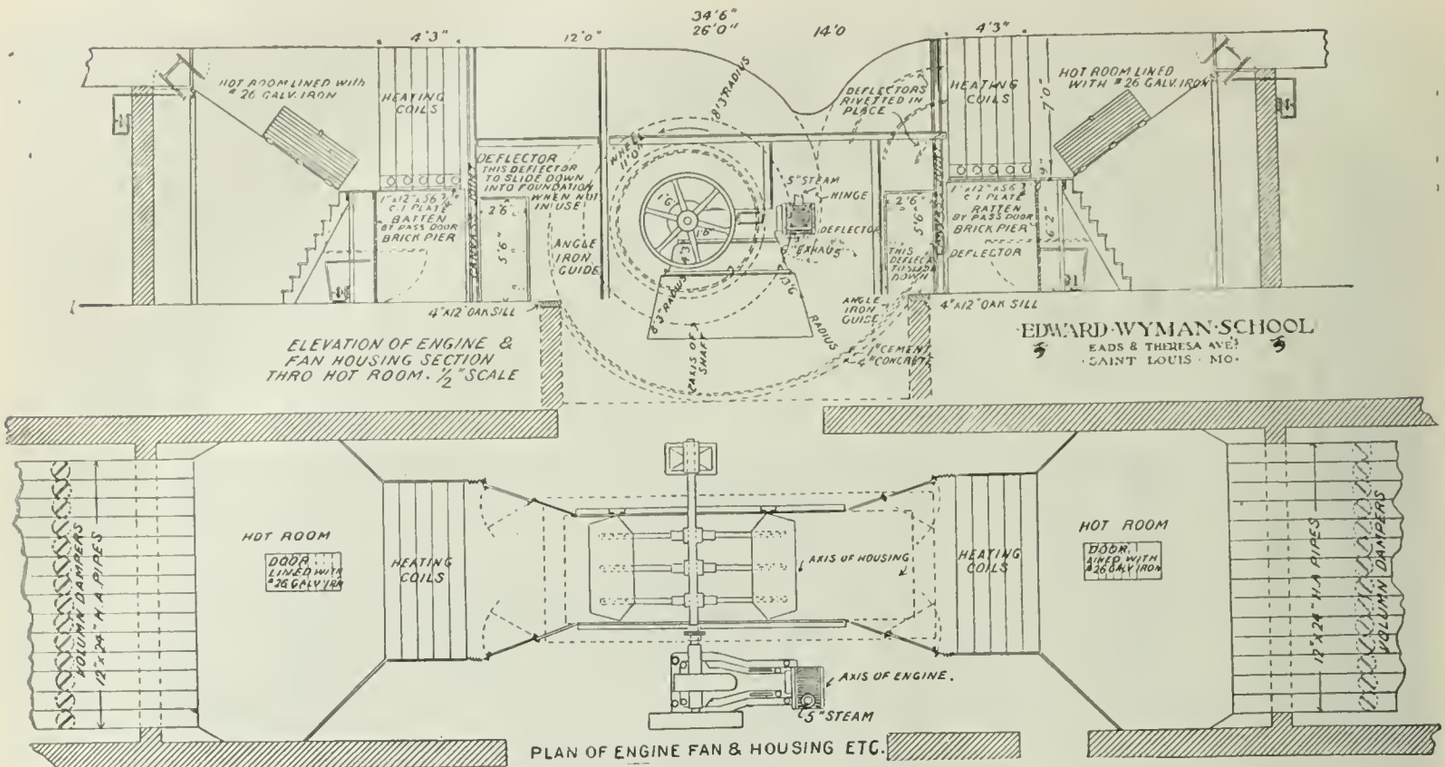


Fig. 4.—Plan and Elevation, Showing Fan, Engine and Heaters.

which prevent them from touching the walls, &c. The air passing through and around the clothing insures that it will be nice and dry when wanted for recess, or at dismissal. This is especially advantageous should the

tending to his duties, would have to climb the stairs to the attic. This he "might forget;" but with only a small three-way cock to open or close, I have never found this duty neglected.

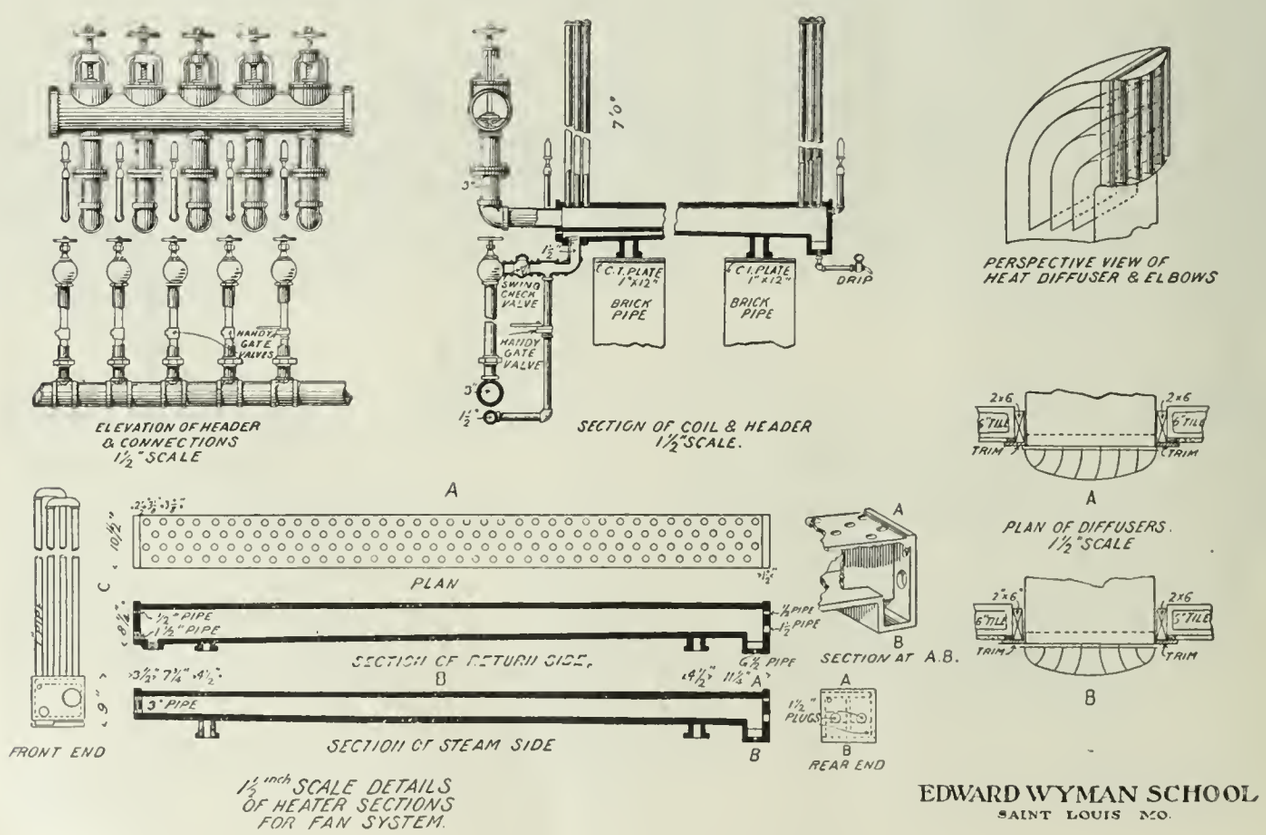


Fig. 5.—The Heaters and Diffusers.

children have been in the rain or snow on their way to school.

The vent flues lead to the attic, where the air is discharged to the outside through towers. Beneath these towers are usually placed two or more doors which are opened or closed by air pressure handled by a small three-way cock or valve located in the engine room.

A by-pass for the whole heating system is arranged as shown by Fig. 7, which shows the actual arrangement at one of the schools, and is used here to show the general scheme in all new schools.

At the point where the fresh air enters the basement from the towers is a door which is closed, and another door shown over the tempering coils connecting with

the first floor hall is opened. The class room doors are left open. When the fan is started a complete circulation of the air in the building is at once established. Not only is this found to be a very economical system of heating the building early in the morning, or at other times when not occupied for school purposes, but the work is accomplished very quickly.

A special form of header was designed for the steam connections to the coils, in order to reduce the number of joints and, consequently, the liability of leaks. Formerly this header was constructed of valves and fittings too numerous to mention, with all their numerous "kinks and twists" in order to get them to "come right." Its advantages can be easily seen.

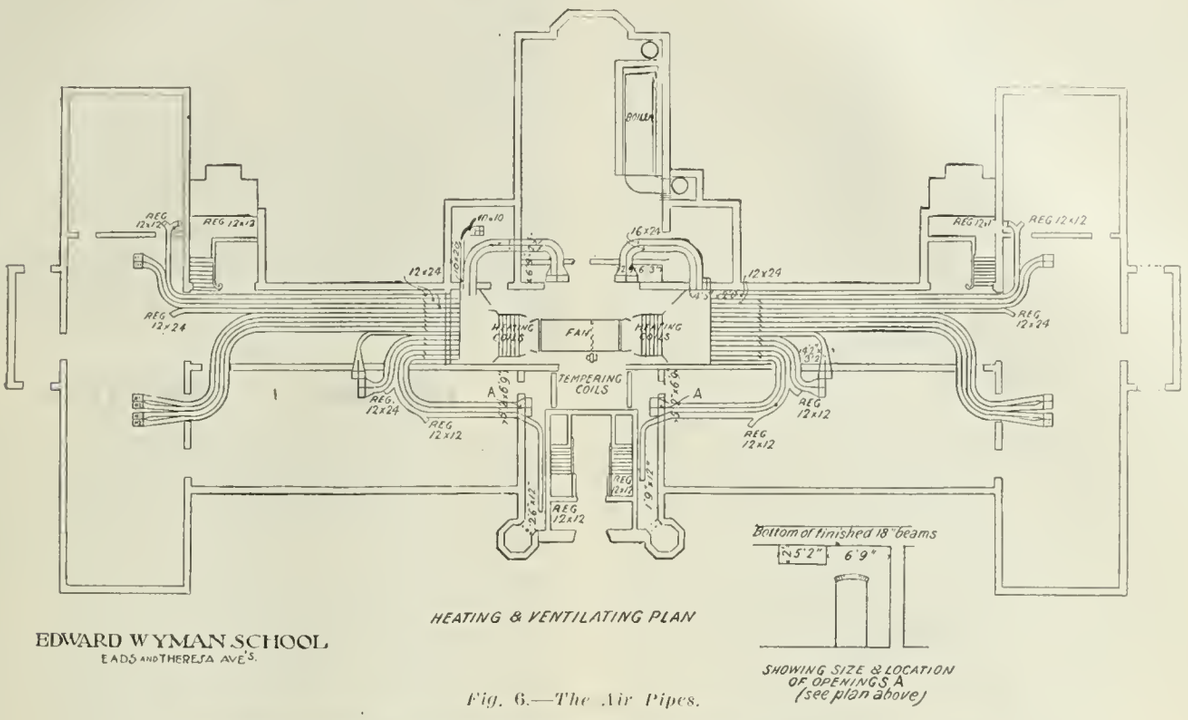


Fig. 6.—The Air Pipes.

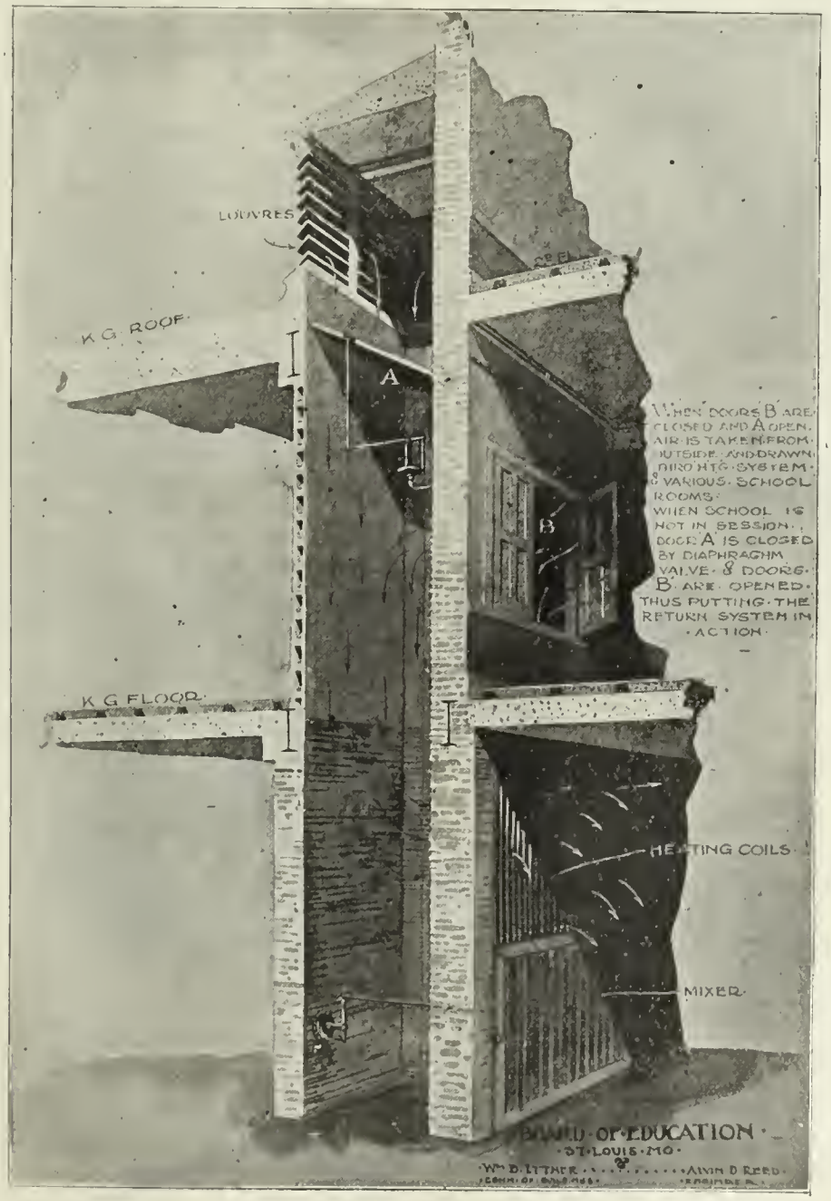


Fig. 7.—The Air Flue and Valves.

The heating of the halls and corridors, as well as the entire basement, is accomplished by hot air. No direct radiation is used.

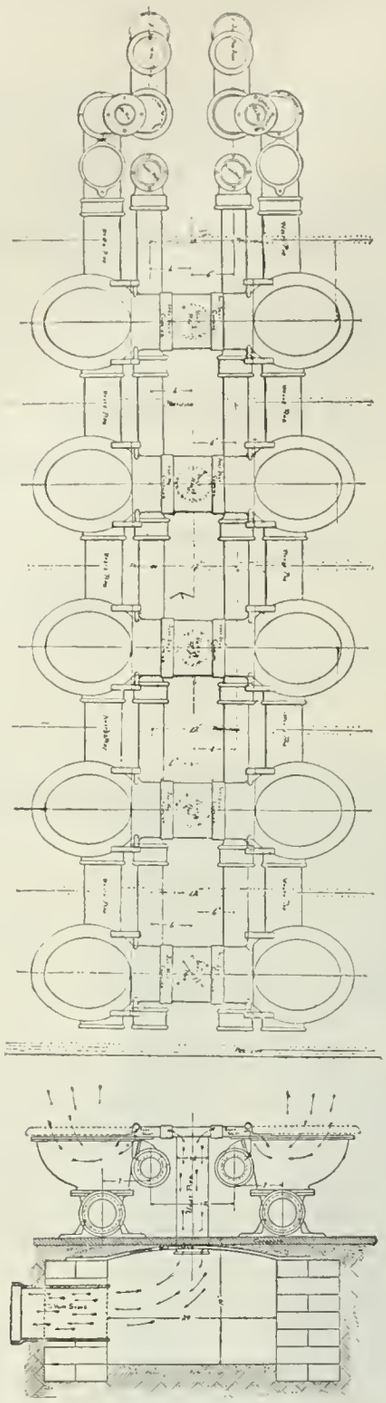


Fig. 8.—The Latrines and Sanitaries.

The sides of the fan housing, the casing of the coils, the sides of the hot air and tempered air rooms are painted and finished in white enamel, as well as the engines, pumps, &c. The pipes, when covered, are painted white. The walls and ceilings are also painted white; and all these, when finished as described, give an idea of not only a useful apparatus, but one interesting and beautiful.

The latrines and sanitaries, shown in plan and elevation in Fig. 8, are also an important part of the fitting up of a modern school house. Each of the closets shown has a local vent of 7 square inches, connected to an underground duct leading to the space around the cast iron stack. The urinal stalls, shown in Fig. 9, are also ventilated in the same manner, each stall being separately ventilated into the underground duct.

We have a special arrangement for keeping a fire in the stack in warm weather when there is no fire in the boiler, insuring perfect ventilation at all times.

THE ANNUAL CONVENTIONS.

It seems that Atlantic City this year is to be the Mecca to which the heating and plumbing trade will make their pilgrimage. It is reported that arrangements have been completed making the Hotel Rudolph the convention headquarters, and the Auditorium on the Steel Pier the place for holding on June 17, 18 and 19 the meetings of the twentieth annual convention of the National Association of Master Plumbers.

The National Association of Master Steam and Hot Water Fitters have also selected Atlantic City as the place for their fourteenth annual convention, which will take place on June 12, 13 and 14, being Thursday, Friday and Saturday of the week preceding the plumbers' convention, which opens on Tuesday, June 17. This leaves Monday, 16, an open day, which may be utilized by the American Society of Heating and Ventilating Engineers for holding a summer meeting. This society ordinarily prefers to hold its summer meeting at a greater distance from New York, but, in view of the fact that so many interested in the heating trade will be at Atlantic City at that time it is quite possible that the Board of Governors may decide to hold a summer meeting at Atlantic City at the same time, although as yet no definite arrangements have been made.

At the last meeting of the Central Supply Association, Put In Bay, Ohio, was selected as the place for holding their meeting on June 23, but some effort is now being made to induce that association to change the place of meeting in favor of Atlantic City. This certainly would give the supply and contracting trade a capital opportunity to discuss important matters of mutual interest.

The American Radiator Company, Chicago, announce that they have arranged with the Titusville Iron Company to offer to the trade their entire output of the Acme Fire Box Boilers. The announcement is accompanied by circulars relating to Bronze Powder for radiator decoration, and to the O. S. Circuit and Distributing Fittings, with diagrams showing their use.

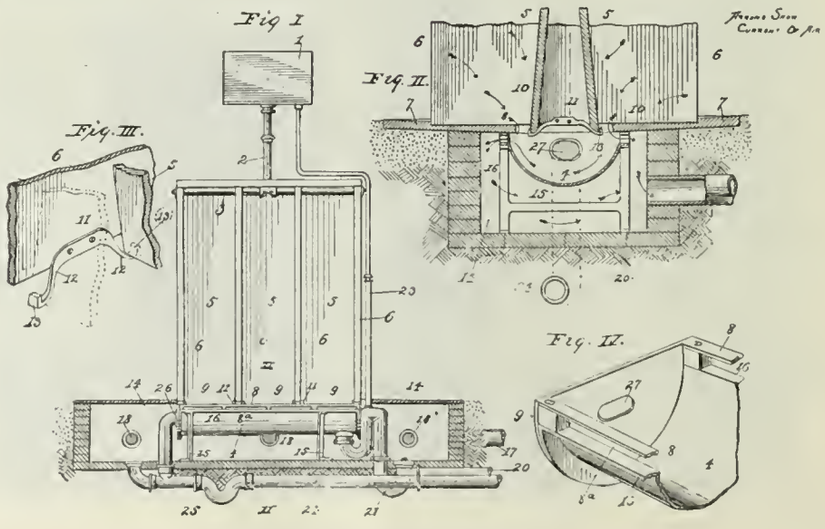


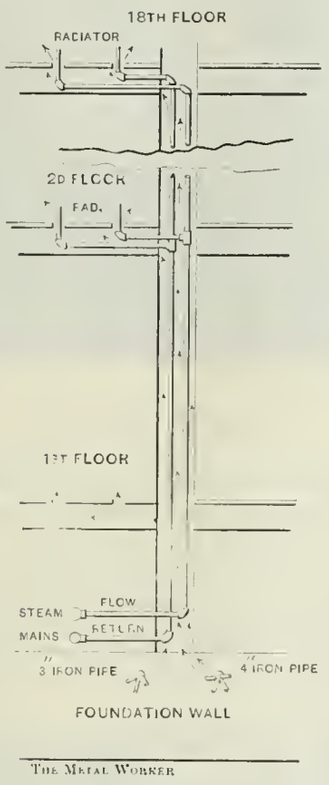
Fig. 9.—The Urinal Stalls.

BAD ODORS NOT ALWAYS SEWER GAS.

BY D. F. N.

A short time ago a complaint was received by a plumber from the superintendent of an up to date skyscraper in New York that the clerks in several of the upper offices detected an odor of sewer gas, which, after a few days, became unbearable. The building, having been finished in the summer, was equipped with modern fixtures and appliances, and the plumber who had the contract was ordered to make an investigation.

The plumber made an examination, and knowing pretty well that all the plumbing was well tested before its completion, covered the same ground as his complainants, and sure enough found that the disagreeable smell was there. In considering how best to locate this evil odor the plumber thought that it might not have its



Bad Odors Not Always Sewer Gas.

tracks well covered in the basement, and that he might be able to intercept it at that point. There, sure enough, it was found. The odor gained an entrance through the massive wall of the building line by means of an opening which held several 3 and 4 inch iron tubes, built in the wall for the purpose of carrying in the 1-inch lead covered electrical services, which were carried through the wall for use in case of emergency, the building having its own electrical plant. At the point where the tubes came through the wall he found a chase in the brick wall from the basement to the upper stories, which conducted the odor with the help of the warm air in the recess and out of the recess into the offices through the cutout for the radiator branches, as shown in the sketch herewith.

This recalls an instance of the owner of a fine dwelling sending a message to a prominent uptown plumber to appear at once to make good the inferior work he had performed. To the astonishment of his patron, the plumber unearthed a decomposed mouse from the back of the wainscoting, almost at his head when taking a bath. These incidents show the unreasonable censure which is sometimes in store even for the tradesman of long experience.

HARRY BROTHERS COMPANY, Dallas, Texas, manufacturers of Galvanized Steel Tanks, Oil, Water and Wind Mill Tanks, are building an extension, 100 x 150 feet, to their plant, and are installing additional machinery for the building of heavy Steel Tanks, Stand Pipes, &c., working iron from 3-16 to ¾ inch in thickness. All machinery has been purchased.

PLUMBERS' REGISTRATION IN ENGLAND.

BY OUR LONDON CORRESPONDENT.

The Plumbers' Registration bill has passed the House of Lords. It has still to go to the House of Commons, and I do not think there is a good chance of its becoming law. It is being actively opposed by ironmongers and heating engineers, who object to it because it throws too much power into the hands of the Worshipful Company of Plumbers, who are notoriously not friendly either to ironmongers or heating engineers, who employ plumbers. The general idea is to arrange for the registration of plumbers after examination, while the Company of Plumbers practically has within itself power to dictate upon what conditions plumbers may submit themselves for examination. Thus, if an ironmonger have a practical knowledge of plumbing, but has not served a term of apprenticeship, and the governing body decide that no plumber may go upon the register unless he has served a term of apprenticeship, the result is highly prejudicial to the ironmonger and the heating engineer. The proposed Council under the act is embodied in the third clause, as follows:

> Subject to the provisions of any scheme made under this act, the Council shall consist of 14 members, and the members shall be appointed as follows:
>
> Three by the Local Government Board.
>
> Two by the National Association of Master Plumbers of Great Britain and Ireland.
>
> Two by the United Operative Plumbers' Association of Great Britain and Ireland.
>
> Two by the County Councils' Association.
>
> Two by the Municipal Corporations' Association.
>
> One by the Royal Institute of British Architects.
>
> One by the City and Guilds of London Institute.
>
> One by the Worshipful Company of Plumbers.

It is true that power is reserved in the act for any aggrieved persons to take objection in Parliament to the scheme when finally embodied, but we know in practice that these protests amount to but little. Hardwaremen and heating engineers would not, I think, object to an impartial authority such as the Local Government Board. But the Council is overweighted with those who are friendly to the somewhat selfish schemes of the plumbers. Strong objection is also taken to the proposed measure on different grounds. It is argued that the day of registration has gone by, and that the day of inspection has come. Those who take this view contend that because a plumber is registered it is no guarantee as to his efficiency, whereas, upon the other hand, if every man who does plumbing has his work overhauled by an inspector, the test is all that may fairly be required. Another objection is that the plumbers would naturally be wedded to old methods, and would be slow to keep pace with the times. If, for example, a thoroughly competent American plumber were to settle in this country to push the plumbing trade on American lines he would have no chance. Altogether, among progressive people the Plumbers' Registration bill is regarded as sectional, privileged and retrogressive.

Sanitary Enameled Ware.

Advance sheets of Catalogue C have just been issued by the Champion Sanitary Enamel Ware Company of Blairsville, Pa., who are represented in New York City by Rollin C. Wilson, 116 Nassau street. The publication consists of 46 pages of highly finished paper, 9 x 12 inches in size, showing by means of half-tone engravings a variety of styles and sizes of the Champion porcelain enameled bathtubs, which are made with nicely turned roll rims of different widths and in five lengths, from 4 to 6 feet. Several pages are devoted to the Champion enameled iron lavatories adapted for bathrooms of private residences and the continuous type suitable for use in large toilet rooms. The last section shows a variety of styles of the Champion roll rim kitchen and pantry sinks, with high backs and corrugated drain boards. The sinks are made to be suspended from brackets or supported by means of ornamental legs. The backs are 15 inches high and contain galvanized iron air chambers, and are adapted to receive the sink bibs.

ANNUAL DINNER OF THE PLUMBING AND STEAM SUPPLY LEAGUE.

The first annual dinner of the Plumbing and Steam Supply League, given at the Drug Trade Club in New York last Saturday night, was one of the happiest incidents that has ever marked the trade. The Plumbing and Steam Supply League having completed a bowling tournament, the awarding of the prizes to the winners, whose names have already been given in *The Metal Worker*, was made the occasion for a dinner, which was attended by some 150 members of the league and prominent men in the supply trade. The success of the league and the pleasure derived from the bowling contests, capped by the delightful affair which the prize dinner proved to be, are entirely due to President E. E. Haff, who originated the idea, and to Secretary Rollin C. Wilson, who ably assisted him in anticipating and carrying to perfection every detail. As a result it has been decided to make the league a permanent fixture. The meeting at the Drug Trade Club, preceding the dinner, gave ample evidence of the cordial relations existing between the various members of the trade. At a few minutes after 7 the voice of President Haff sounded above the merry sallies that were being interchanged, inviting all to proceed to the dining room, where the following *menu* was discussed:

Menu.

●●●

FIRST FRAME
"Splits All Along The Line."
Blue Points on half shell.

SECOND FRAME
"Having The Soup Poured Into Us."
Cream of Chicken a la Reine.

"Good Eye"
Olives Celery.

THIRD FRAME
"All Right"
Filet of Striped Bass, Marguery.
Potatoes Bermuda, Parisienne

FOURTH FRAME
"Take Your Time"
Tenderloin of Beef piqué, with Mushrooms.
French Peas.

FIFTH FRAME
"Easy Spare."
SORBET—Frozen Scotch.
Cigarettes

SIXTH FRAME
"Look Out For A Foul"
Roast Philadelphia Chicken, Stuffed with Cresses
Cranberry Sauce. Celery Mayonnaise.

SEVENTH FRAME
"Triple Headers."
Neapolitan Ice Cream
Assorted Cakes. Fancy Macaroons.

EIGHTH FRAME
"A Strong Finish"
Roquefort and Brie Cheese

NINTH FRAME
"All Down."
Coffee

TENTH FRAME
Cigars.
"Set 'Em Up On The Other Alley"

When the cigars had been lighted at the tenth frame, President Haff, in announcing that the prizes were to be presented to the winning teams and individuals, spoke feelingly of the successful outcome of the venture, due to the ever ready co-operation of every member of the league. The various speakers who had been invited to present the prizes seemed to be inspired by the occasion and the brilliancy of their witty sallies received appreciation and applause that could by no means have been drawn out by mere oratory. In connection with the speeches the referee had his eye on the foul line, and saw no breaks, for the speakers all made strikes and still had something to spare. Among the speakers were: J. H. Campbell of the Trenton Potteries Company, John A. Murray, Frank K. Chew of *The Metal Worker*, F. W. Blauvelt and George M. Fawcett of F. N. Du Bois & Co., Thomas Delaney of Coyne & Delaney, A. B. Beith of the Dimock & Fink company, Frank P. Richardson of the Colwell Lead Company, James M. Heatherton of the *Plumbers' Trade Journal*, Charles Hirschfield of Landers, Frary & Clark, John K. Allen of *Domestic Engineering*, W. S. Emery and Harry M. Smith of C. S. Locke & Smith. In presenting the second prize for individual average to Rollin C. Wilson, Mr. Blauvelt of F. N. Du Bois & Co. read the following lines, which were received with applause:



E. E. HAFF, Ex-President.

YOU COULDN'T HARDLY NOTICE IT AT ALL.

When Rolly rolled his average score,
If he had made just one spare more,
He'd won first prize and made a bigger haul,
But although the game was fair,
He just missed it by a hair,
And you couldn't hardly notice it at all.

As captain of the Salesmen's team,
With honest pride his eye did gleam
Upon his bowlers, who were doomed to fall.
And when the Murray team they met,
Although they went for them, you bet,
You couldn't hardly notice it at all.

Then they rolled Du Bois & Co.,
And found their team was not so slow,
But still they thought they'd drive them to the wall.
And while they played a good, stiff game,
I have to tell you, all the same,
That you couldn't hardly notice it at all.

So to drown their woes up to the bar they flew,
And ordered several drinks from our good friend, Cadieu,
I'm told they all took a Wilson High Ball,
And when they'd drank it down
You'd thought their heads would swim around,
But you couldn't hardly notice it at all.

Now with the Salesmen's team we all do sympathize,
Because they had hard luck and didn't win a prize
To which with pride they might attention call.
But when they only sent three men,
Of course, their score was queered for them,
And you couldn't hardly notice it at all.

Two prizes were awarded in addition to those on the regular schedule. One was presented by James Conran of the Standard Mfg. Company to W. S. Reins of the Central Foundry Company, for making a strike, which was said to be the only one he made. In the absence of Mr. Reins, Vice-President C. G. Beach, also of the Central Foundry Company, agreed to accept the prize for his team mate, and to him and the audience Mr. Conran delivered a very touching oration. In reply Vice-President Beach, in behalf of Mr. Reins, accepted the beautiful leather medal presented, with remarks expressing a fitting appreciation of the honor conferred, and assuring all that it would not only be worn with pleasure by Mr. Reins, but would be handed down to his posterity.

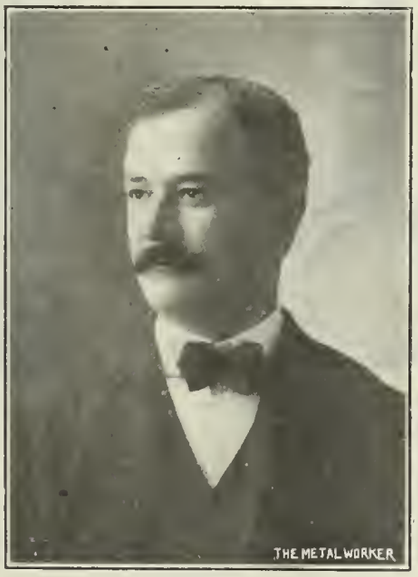
The other prize was presented to Samuel S. Glauber

by Vice-President Beach. This prize Mr. Beach took down from the walls of the club room, where it was hung as one of the decorations. It was a handsome stein of the four-story character, and topped with a suitable metal roof. The sides seemed to be covered with ornamental steel siding and decorated with radiator bronze. After a brilliant speech commending Mr. Glauber's sportsmanship and skill, Mr. Beach invited him to



ROLLIN C. WILSON, Ex-Secretary.

come forward and receive the cup. At this point many arose and protested against the presentation, some stating that they had money on Mr. Vogel which he had won for them, and they objected to the prize being presented to the loser. Vice-President Beach explained that he did not intend to be deprived of the pleasure of presenting the prize through the absence of the vietor, and that even if Mr. Glauber was the loser he should present the prize to him as a tribute to his grit. Instructions were given to the proper authorities to prevent Mr. Glauber



MARTIN BEHRER, President.

from removing the property of the club from the building. This little episode called forth no small amount of mirth. particularly when Mr. Glauber, on being held up at the door, decided that the prize was too large to carry.

After the prizes had been presented and the speeches made, President Haff rapped for order, and said that a motion had been made that the Plumbing and Steam Supply League be continued for another year. At the suggestion of E. E. Benas of Thomas G. Knight, Brooklyn, to make it a dozen, President Haff consented. It should be recorded that Mr. Benas, by his side remarks, contributed no small share of the mirth of the evening. He spoke frequently, although his name was not among the list to address the prize winners, and his remarks were always to the point. The motion was unanimously carried. The president then announced that it was necessary to elect officers for the ensuing year, and the Wire Pulling Committee nominated the following officers:

President, Martin Behrer.
Vice-President, C. V. Driggs.
Secretary, W. G. McCormick.
Treasurer, Fred. Lowe.
Board of Managers: W. S. Gibbs, A. E. Good, J. R. Igelstrom, A. E. Beith, W. B. Ogg, Captain W. S. Emery.

The secretary was instructed to cast one ballot for the nominees, who were unanimously elected.

It was nearly 12 o'clock when the guests arose from the table, fully appreciating the theme which had been touched upon by all of the speakers, which was the value of cultivating the social side of business. Many instances were related where small annoyances and trade



W. G. McCORMICK, Secretary.

grievances had been explained at the bowling alleys, and misunderstandings had been adjusted, demonstrating that even in the pursuit of the almighty dollar the highest benefit can be derived in the relaxation that comes from cultivating the social element.

Copper Floats.

The Hercules Float Works, Springfield, Mass., issue a general catalogue and price-list, No. 2, of Hercules seamless copper floats and air chambers for all pressures. The standard weights and sizes of the copper ball floats range from 2½ inches, weighing 3 ounces, to 16 inches, weighing 39 pounds. They also make column floats for water columns, boiler feeders, to order, any diameter to 15 inches and to 22½ inches in length. Their seamless copper air chambers are guaranteed to be free from imperfections in manufacture and to have been tested to a pressure of 300 pounds per square inch, and for a working pressure of 150 pounds. All floats are also guaranteed to have been tested to 300 pounds pressure per square inch.

WILLIAM C. TUCKER, civil and sanitary engineer, 156 Fifth avenue, New York, is frequently visited by members of the plumbing supply trade and the contracting plumbers, who wish to consult him as to what is required in buildings in which he is retained by the architect to design the sanitary and drainage system. Mr. Tucker has been the sanitary engineer in charge of work in some of the largest buildings in New York City, and has also been retained to design the sewage disposal system for many large country houses isolated from sewers.

PLUMBING SUPPLY HOUSES TAKE ACTION TO STOP AN ABUSE.

The plumbers' supply houses in New York City, Brooklyn and vicinity have taken joint action for the purpose of abolishing certain abuses which have been allowed to continue in the trade for some time. One of the most flagrant and expensive impositions, from the supply house point of view, is the abuse of the returned goods privilege.

There is no trade or calling, other than that of plumbing or steam fitting, wherein the retailer is allowed to order goods indiscriminately and return them, if not wanted, at a subsequent date. In many lines of business the return of goods is reasonable, for some goods always remain in a salable condition. This is not the case, however, in the plumbing supply business, owing to the fact that the major part of the goods are highly finished and plated. Brass work, especially if it is highly finished and nickel or silver plated, when exposed to the atmosphere, and also when it is handled, becomes unsalable. Moreover, in most cases where goods are ordered in large quantities and are removed from the original packages the packages are broken or lost, and the goods when returned are found to be in an incomplete and unsalable condition.

Aside from the expense entailed in the double handling of goods, there are also involved the question of looking up back charges, the identification of goods, the bookkeeping necessary to credit customer, and the charge of the returned goods to the stock account. All this expense, or nearly all of it, can be avoided if the proper attention is given to the orders when they are originally placed.

This is true also of cast iron soil pipe and fittings, cast iron sinks, and goods of that nature. Excessive quantities of the materials are very often ordered to be sent to a building which is in course of erection, and the goods which are not used are allowed to remain in exposed places where mortar, lime and dirt of all kinds are allowed to fall upon them and make them unsalable for the jobber.

It is to curtail or prevent this abuse that the jobbing trade in this section of the country have got together. The following circular bearing on the matter was issued simultaneously by those concerns signing it:

March 15, 1902.

To the Trade:

In order to avoid all misunderstandings regarding the position of the manufacturers and jobbers of plumbers' supplies upon the question of returned goods, the undersigned respectfully notify the trade that hereafter when orders have been correctly filled, no credit will be allowed for goods returned, unless a full explanation is given to, and consent obtained from, the manufacturer or jobber, and all goods returned, if accepted, will be credited at the same prices at which they were charged, less ten (10) per cent. and all shipment and receiving expenses.

Respectfully,

Fred. Adee & Co.,
Behrer & Co.,
The Campbell Supply Company,
R. E. Carey,
Chambers & Ainslee,
Colwell Lead Company,
Cornell & Underhill,
Crane Company,
Thomas M. De Laney & Co.,
Dimock & Fink Company,
F. N. Du Bois & Co.,
W. S. Emery,
J. E. Gallagher,
Samuel S. Glauber,
The Hoffman-Hinsdale Company,
The Henry Huber Company,
Hull, Camp & Co.,
W. H. Hussey & Son,
Geo. P. Jacobs & Co.,
Jersey City Supply Company,
Estate of Edwd. F. Keating,
Thomas G. Knight,
Le Roy Shot & Lead Works,
C. S. Locke & Smith,
McElraevy & Hauck Company,
Thos. R. McMann,
McNab & Harlin Mfg. Company,
Wm. McShane Company,
Malbin & Kammerman,
Mayor, Lane & Co.,
Metropolitan Supply Company,
The J. L. Mott Iron Works,
John A. Murray,
Nason Mfg. Company,
National Lead Company,
The Peck Bros. & Co.,
H. P. Read Lead Works,
M. Reynolds Plumbers' Supply Company,
Ronalds & Johnson Company,
John Simmons Company,
Spencer & Haviland,
Standard Plumbing Supply Company,
Henry Steeger,
John Trageser Steam Copper Works,
Yorkville Plumbers' Supply Depot.

The Barry Mfg. Company

The pioneer plumbing house of this city and State, says the *News-Tribune* of Muscatine, Iowa, has been transferred to its new owners, the Corry & Warentine Company of Davenport, who will continue the plumbing contracting business conducted heretofore by the Barry Mfg. Company, at 409 East Second street. The Barry Mfg. Company enjoy the distinction of being the earliest plumbing contractors in Iowa, having established the business at Muscatine in 1875, since which they have been doing a continuously increasing business. They entertained no thought of disposing of their contracting branch until an offer was made to them, which now enables them to devote their attention to the large factory located at Third and Mulberry streets, where they manufacture an extensive line of plumbers' supplies.

New Walker Boiler Catalogue.

The Walker & Pratt Mfg. Company, Boston, Mass., are issuing to the trade their Catalogue No. 31, which has recently been compiled by John A. Fish, manager of the company's wholesale boiler department. This catalogue is devoted to the new Walker boiler for steam and hot water heating, which is of the vertical sectional type. The boilers are made with three different widths of grates—15, 20 and 32—of varying capacity, rated to carry from 400 to 4500 square feet of hot water radiation, and from 240 to 2700 square feet of direct steam radiation. Additional features which will be found of interest to the steam fitting trade are the width, length and hight of the boiler, the shipping weight, and other detailed information. The catalogue also shows the grate and ash pit section and the different styles of grate bars with which the boiler can be furnished. The company also manufacture steam radiators of the vertical loop pattern indirect pin radiators. The catalogue is accompanied by a long list of parties who are using the new Walker boiler with satisfactory results.

Expansion Bolts

The illustrations herewith relate to two of the later forms of expansion bolts put on the market by the Steward & Romaine Mfg. Company, 124 North Sixth



Fig. 1.—Expansion Bolt with Pipe Hanger Attachment.



Fig. 2.—Expansion Bolt with Reducing Pipe Socket.

street, Philadelphia, Pa., who manufacture an extensive line of expansion and toggle bolts for a great variety of purposes. Fig. 1 is an expansion bolt with pipe hanger attached, which is supplied to manufacturers of pipe hangers and other supporting hangers or rings, which are completed by the pipe hanger manufacturer as illustrated. Fig. 2 is another form of bolt which shows a reducing pipe socket attached in place of hanger. It will be seen that the end of the bolt opposite to the expansion end is threaded with gas pipe thread to fit into the socket. Another device of the same group not here shown is a hollow expansion bolt for electrical purposes, which permits the running of wires through the center of the bolt, the shank portion being made of tube iron, threaded to receive the expansion parts. This form is especially suitable for holding arc lights and electric fixtures, &c.

The Crane Company Buy Out the John Schram Company.

One of the pioneers in the stove, furnace and house furnishing goods business on Puget Sound was John Schram, who, as his business grew, eventually became head of the John Schram Company at Seattle, Wash. A year ago the company closed out the retail branch of their business and have since devoted themselves to jobbing plumbing and steam fitters' supplies, in addition to other lines of goods in demand in their territory. The company were recently visited by A. F. Bennett of the Crane Company of Chicago, who were looking for a suitable site and building for the establishment of a branch house. The new building and surroundings of the John Schram Company were found to be admirably adapted to their purpose, and the company proposed buying out the concern. The Crane Company were satisfied with the offer made by the John Schram Company and the sale of the entire business was effected on March 11. The Crane Company will take entire charge of the business on April 1. The company now have 22 branch houses throughout the country, and on April 1 they will have four on the Pacific Coast, at San Francisco, Portland, Los Angeles and Seattle.

Mr. Schram, who was the head of the old concern, is one of the best known men in Seattle, having established himself there 20 years ago. He was burned out in the great Seattle fire, but rebuilt his plant and eventually established a large business throughout that section. He has frequently refused political positions, but has been a very active member of the Chamber of Commerce, of which he is the second vice-president. His retirement from active business at the present time affords him an opportunity for making a long desired European trip during the coming summer.

Power for the Plumbing Inspector.

In many cities the plumbing inspector's office is under the jurisdiction of the Board of Health, and it is well known that health boards are usually equipped with wide powers. According to the *Post* of Louisville, Ky., it is proposed to give the plumbing inspector in that city the right to enter a property and go over it at will, to test all the pipes according to his own plan, and to condemn any work that seems to him inexpedient or faulty, the owner or occupant being required to make the repairs in accordance with the views of the inspector. Evidently there is some opposition to the conferring of such sweeping power on an official, as the following comments from the *Post* would indicate:

The man most apt to know about the plumbing is the head of the family, for he has most at stake. He does not wait for the inspector. He sends for his own plumber and makes what changes he deems wise.

This is the only inspection that is worth anything. Official inspection is an impertinence and is designed merely to increase the number of officers on pay and to vex and tax the householders. Plumbing is not an applied science. Certain rules are accepted, but the application varies with each establishment.

It has been a common experience, for illustration, for one plumber to condemn unreservedly the work of another in installing a natural gas outfit, remove it and put in another with exactly the same defects or shortcomings. All that remains is for the householder himself to watch results and keep the best plumber he knows at work until the defects are cured.

It is preposterous to say these things are better done by officers than citizens. There is the city itself, with its vile gutters, its uncleaned streets, its insufficient sewers; let the city alter, improve, perfect these things and we will hear little or nothing about defective plumbing.

The ordinance is mischievous and uncalled for. More men want office. Getting it, they will to justify themselves be tearing out the plumbing in hundreds of houses or ordering it out, and the end will be worse than the beginning. The householders are to be the victims of this office, and before it is too late they should enter their protests with their Aldermen and Councilmen.

In sections where the plumbing is of a primitive character more or less objection is always experienced when radical changes are necessary to make the plumbing come up to modern sanitary requirements. Seeming hardships are felt by the individual, notwithstanding that the object is for the public good and the individual is sure to enjoy the greatest benefit. The sweeping powers that the official would possess if the authority mentioned was conferred upon him differ from what is generally customary only in that the inspector would have the right to enter premises, instead of getting a permit or order in a special form from the Board of Health, which always has such a power when necessity demands its use. The assumptions in the comments quoted may seem reasonable to the layman, but to those who have made a study of house drainage systems they will seem a little weak.

New York City Notes.

Some of the jobs which have been in course of preparation are now ready for the plumbers to begin work upon them. Among them are a new apartment house at 138th street and Lenox avenue, where S. J. McCarthy is doing the plumbing. C. Muller & Son of 731 Seventh avenue have the plumbing in a new apartment hotel to be erected at the corner of Sixth avenue and Fifty-sixth street. Thos. Kirkwood of 415 Lexington avenue has three buildings on Twenty-first street, near Tenth avenue, for the General Theological Seminary of the Episcopal Church. W. G. Cornell of 54 Lexington avenue has the apartment hotel in connection with the Hotel Marie Antoinette, at the corner of Broadway and Sixty-seventh street; also the new Music Building, on the site of the old A. T. Stewart mansion, at Fifth avenue and Thirty-fourth street, and the Broadway Building, at the corner of Broadway and Maiden lane. E. B. Gordon of 61 East 126th street has the Church of St. Charles Borromeo, on 141st street, west of Seventh avenue.

* * *

George A. Pearse, Jr., of 161 West 120th street has three private houses on Seventy-seventh street, west of Central Park West, and facing the Museum of Natural History. John Toumey & Son have a row of stores that are being put up at the corner of 125th street and Seventh avenue. T. J. Byrnes will be busy for some time to come with work in the new Custom House, which occupies the block on Bowling Green and Whitehall, State and Stone streets. Kelly Brothers of 1661 Amsterdam avenue, in addition to their many other jobs, have the plumbing in the large building at Twenty-third street and Seventh avenue. J. H. Steinmetz of 145th street and Amsterdam avenue has a church building on 142d street, near Amsterdam avenue. T. J. Cummins has five high class private houses on 100th street, east of West End avenue. M. M. Golding has a business and loft building on Sixty-fifth street, west of Broadway. Geo. Dillon of 258 East Broadway has a factory building, 50 x 148 feet, at 20 and 22 Hancock street. Otto J. Schwarzler of 2800 Third avenue has an apartment house, 50 x 100 feet, on 100th street, west of Park avenue.

* * *

The plumbers who are doing business in other than their home boroughs have been put to considerable annoyance by the fact that they have to take out bonds in each borough in which they do business. Should some of the other departments with which the plumbers do business be as strict in ascertaining who the plumber is who happens to be doing the work as the various sewer departments are there would not be as many unlicensed plumbers working under other people's licenses as there are to-day. A few revocations of licenses by those who have authority would be a wholesome lesson.

On March 10 the Novelty Iron Company, Canton, Ohio, suffered from a fire which entirely destroyed their foundry. The company are now engaged in adjusting the insurance, removing the refuse and getting ready to meet the demands for the Our Own line of Steam and Hot Water Boilers. These Boilers are being pushed in New York and vicinity by I. G. James, who has recently transferred his office to the Park Row Building, New York City.

Enameling Rough Cast Iron Bathtubs on the Outside.

"In the work in a large apartment house I am called upon to enamel a lot of cast iron, porcelain lined bathtubs on the outside. The surface is very rough, but the finish is to be as smooth as the inside. I have given two coats of cement, such as is used for iron safes, which I have rubbed down with lump pumice stone, and I am now wondering what the result will be in six months, after the hot water has been in the tubs. I think there must be a filler and surfacer for this kind of work, better and cheaper than the method I am now using, and would like to have advice on the subject."

In response to this request, made to the *Painters' Magazine*, the following is given: We think that you can procure from one or more paint manufacturers the proper kind of material required for the work in hand. You require an iron filler, such as is used on gas engines, of a color that is close to the finish you wish to apply. This filler must be of puttylike consistency, so that for very rough places you can apply it with a wide spatula, and thinning it somewhat with turps, like an iron safe plaster to less rough surface. This filler must be of such a nature that when applied heavy it will show no cracks, and yet have enough binder so that it may be rubbed with pumice. It must also sandpaper freely in from six to eight hours. When the surface is so prepared, any good grade of engine enamel will stand the action of hot water very well, because the outside of bathtub will never become as hot as the cylinder of an engine.

An Old Roman Water Official.

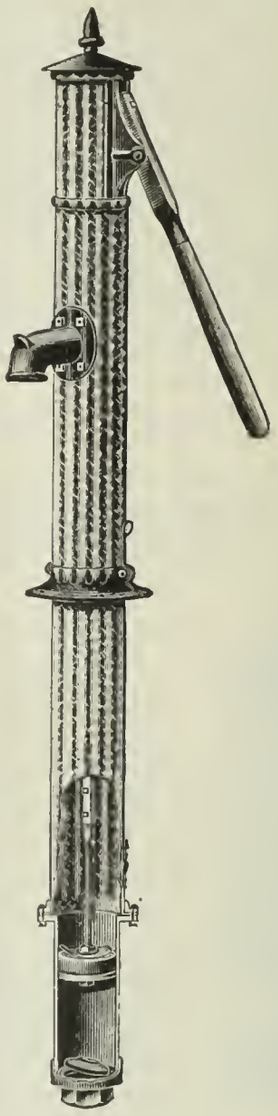
In his translation of the two books of the water supply of Rome, by Sextus Julius Frontinus, says *Fire and Water*, Clemens Herschel gives us a good idea of the work done by that ancient hydraulic engineer in supplying the capital of the world as known to its civilized inhabitants in the year of our Lord 97, when Nerva was at the head of the Roman Empire. The historical notice is rendered all the more interesting by the addition of the photographic reproduction of the original Latin manuscript and explanatory chapters by the editor. Frontinus was water commissioner (*cuator aquarum*), and his work shows that he, in common with other hydraulic engineers of his day, knew a great deal more about his profession than most people of to-day give him or them credit for. The ordinary hydraulic engineer of every day life may imagine it to be a comparatively modern discovery that water will "rise as high in a pipe as the source from whence it came," and that for that reason the Roman officers who had charge of the water supply went to enormous expense in building high aqueducts spanning vast valleys, and carrying the water for miles overland, when the same purpose could have been served by the use of underground pipes. But the reader of Vitruvius knows that he was acquainted with the inverted siphon, while the elder Pliny's casual remark that "water climbs to the same hight as that from which it sprang" shows that the same knowledge was common to all the scientists of his day. Had the Romans been able to secure cast iron mains like those now in use, they would never have gone to the expense and trouble of building aqueducts. But their scientific and mechanical knowledge had not attained a hight which has been reached only of comparatively late years, and even in the twentieth century is not universally made use of. The Romans, therefore, as Mr. Herschel points out, simply did "what every engineer does at the present day, using to the best advantage the materials and facilities for his work found at hand for the time being."

Mr. Herschel also gathers from his researches into the matter of distribution and supply that, instead of nine aqueducts carrying to and discharging into the city of Rome between 350,000,000 and 400,000,000 gallons a day, the supply they afforded daily was never more than 84,000,000, ordinarily only 40,000,000. As a rule the nine aqueducts were not all running at the same time, since every now and then one or more was shut off for repairs, to say nothing of the constant impudent and open thefts of water which were the rule and not the exception.

Mr. Herschel is the first to produce in complete and authentic form the Frontinus manuscript, which is one of the prized possessions of the famed Benedictine Abbey of Monte Cassino, Italy. The book is doubly interesting, both from a scientific and an historical standpoint.

Twentieth Century Pump.

The Berger Mfg. Company, Canton, Ohio, have bought out the Twentieth Century corrugated galvanized steel pump, here illustrated. The body of the pump is of corrugated form which gives greatly increased strength as well as allowing something for expansion in freezing weather. A special device enables an individual to open an outlet so that a vent is provided for all water contained in the pump as a preventive in times of low temperature. The cast iron base is adjustable, and can be set at any hight to suit the user. The cylinders are cast iron, and are referred to as simple and strong. The pump can be quickly set up, lifts the water easily, and delivers it rapidly. Especial attention is called by the manufacturers to the fine quality of material and workmanship of the pump.



Sectional View of Twentieth Century Pump.

The Home Heating Company have been given a franchise by the city of Anderson, Ind., to operate a central heating plant and lay mains in the streets. The ordinance giving the franchise stipulates that the rate of charges to customers shall be 17 cents per square foot of radiation for hot water heating and 26 cents for steam heating. The company are to pay the city 2 per cent. on their gross receipts after 1905.

Soldering Fluxes and Acids for the Apprentice.

BY HELMAR.

A boy who had worked at the business but a few weeks when asked how he was getting along rattled off the following:

"Lead tarnishes very quickly. Cleanings for wiped joints should be covered with tallow as soon as shaved. Tallow keeps the air from tarnishing the cleaned part and does not interfere with the solder sticking to the lead where it is cleaned. Lead should not be cleaned long before using or soldering it. When cleanings are to be soldered immediately, powdered rosin makes a good flux; it seems to have the power of making solder unite with lead, just as though it had been melted together in a pot instead of being melted on with an iron or by pouring. A particular feature of all soldered joints is to have the solder and the cleaning perfectly clean. No joint is safe or permanent unless both are clean. Rosin will not do for wiped joints; it 'blows,' smokes and sticks to the cloth, stiffening it and unfitting it to wipe with. Ordinary sperm candle 'tins' on lead, brass and copper; it tins under the soiling on wipe joints, too, so it is not good to cover wipe joint cleanings. Raw muriatic acid (commercial) works well on new and old galvanized iron. It must be wiped and washed off immediately after soldering or it will eat into the iron and injure the pipe. Galvanized iron boilers and pipe cannot be soldered well, and if at all, the galvanizing must be filed off so that the solder will take to the iron all around and over the leak. 'Cut' acid (muriate of zinc, made by putting in muriatic acid all the zinc it will dissolve) works well on new galvanized iron. Raw acid is often used on old galvanized iron, because it cuts the dirt off easily. Acid diluted with water is used on galvanized iron and brass, too, but 'cut' acid must be used when plain filed iron is to be tinned and soldered. Plain iron ends tinned with acid are not good for solder. Ever so little zinc affects the solder. Brass cleanings should never be tinned by dipping into wiping solder; brass contains zinc and the solder melts some of the zinc out of the brass, then the brass is not so good and the solder is ruined for wiping purposes. A face put on a soldering copper by rubbing it in rosin on a brick, after filing, will stay longer than one put on with acid or sal ammoniae."

The boy says "The man I work with told me this every day until I could remember every word or any part of it, and said that such knowledge would get handier every day, and that if there was anything wrong in it I would find it out soon enough."

The Brass Crafters.

The above title adorns the first cover of a 48-page catalogue issued by the Colwell Lead Company, 51-65 Centre street, New York, devoted to bathroom and lavatory accessories. On the front cover of the catalogue is shown in colors a scene in a brass foundry at pouring off time. The back cover shows a fine bathroom fully equipped with the product of the brass crafters. The catalogue is profusely illustrated with half-tone engravings displaying a variety of soap dishes, adapted for attachment to side walls or to marble slabs and to hanging on the edge of the bathtub. These are followed by a variety of sponge holders and combination soap and sponge holders. Another section contains some very ornamental towel holders, some being made in connection with tumbler holders. A handsomely nickel plated towel basket is another one of the bathroom accessories. Bathtub seats occupy two pages, and the last portion of the book is occupied by tumbler holders, tooth brush holders, comb and brush holders and racks in a variety of ornamental styles, some shown with a soap cup attached. Glass shelves, clothing racks and beveled plate glass mirrors with nickel plated frames occupy another section. A variety of ornamental toilet paper holders completes the catalogue.

W. J. Hyland has purchased the property at the corner of Dwight street and Harrison avenue, Springfield, Mass., on which he will erect a one-story brick structure for his plumbing business.

Heating and Plumbing Notes.

A master plumber of Paterson, N. J., writes in the Paterson *Press* an open letter to the master plumbers of that city calling attention to the fact that while the city had passed through a fire and a flood without assistance the plumbers are now menaced by an influx of out of town plumbers, who desire to participate in the benefits to be derived from work on the new buildings to be erected. The Paterson master plumber evidently entertains the idea that the plumbers in that city are entitled to the work, and that inasmuch as the city has not asked for assistance from outside the profits that are to be derived from the rebuilding of the burned and damaged portions of the city should be enjoyed only by its citizens. He calls attention to the fact that for some time there has been no master plumbers' association in Paterson, and deplores the fact that there is now no organized body to protect the interests of the plumber.

Clifford Schlemmer, representing Oliver Schlemmer of Cincinnati, Ohio, has been spending a few weeks in New York visiting the trade in the interests of the O. S. Distributing Fitting and the Temple Vent Fittings for steam fitters' and plumbers' use.

The Jarecki Mfg. Company, Erie, Pa., have booked some large orders for Brass Goods for the London market.

The Standard Sanitary Mfg. Company of Pittsburgh are reported to have received a substantial contract for Bathtubs and other Enameled Sanitary Ware from a firm in Frankfort, Germany, for shipment to St. Petersburg, Russia.

There is a movement on at Birmingham, Ala., to erect there a $100,000 Sewer Pipe plant. S. L. Russell will be general manager of the company. Orders for the necessary machinery have been placed in Cincinnati.

An acetylene gas plant will be established at Berryville, Va., by Herbert B. Warde.

The Handbury Heater Company are moving their manufacturing plant from Pekin to Peoria, Ill.

The New York office of the Gurney Heater Mfg. Company of Boston, Mass., has recently been furnished with new attractions. Those who visit 111 Fifth avenue will find the floor newly carpeted and samples of the 1100 Series Vertical Sectional Bright Idea Boilers, beside the 404 Boilers, 445 Steam and Doric Steam and Hot Water Boilers. The Radiators made by the company are also attractively displayed so that the heating contractor can find goods adapted for any requirements. The house report an increasing business with their large sized heavy duty Boilers.

W. H. Switzer of the Utica Heater Company, Utica, N. Y., informs us that he is experiencing a fine demand on the Pacific Coast for Superior Hot Air Furnaces, Utica Heaters and the Imperial Steam and Hot Water Boilers.

Morgan & Co. of San Francisco, Cal., bid $1184 and secured the contract for the heating apparatus for the new public library at Riverside, Cal.

Roche & McGuire, New London, Conn., have the contract for plumbing the Gorton Block, in that city.

H. T. Gates, New York representative of the Prizer-Painter Stove & Heater Company of Reading, Pa., at 160 Fifth avenue, has a fine office and showroom, where he is prepared to acquaint the heating trade with the merits of the Henderson Thermo line of Steam and Hot Water Heaters made by the company.

George M. Couch, Hartford, Conn., has installed a Thatcher Furnace for heating the house of E. G. Mills, Farmington, Conn.

The Crane Company, Chicago, have just issued a special supplementary catalogue of extra heavy Valves and Fittings for 250 pounds working pressure. This catalogue comprises 96 pages, and treats of Straightway, Globe, Angle, Cross, Swing Check, Foot and Blow Off Valves, Expansion Joints, Malleable Elbows and Tees, Flanged Fittings, Pipe Bands, Flanged Tees and Crosses, &c., which are designed and manufactured for high pressure. The catalogue gives a great deal of valuable in-

formation relative to the different styles of Valves and Fittings, together with tables of dimensions, which will be found very desirable for the use of engineers and others in laying out their work intelligently to avoid delays by correspondence. The company will issue their regular standard catalogue about April 15.

St. Joseph Pump & Mfg. Company, St. Joseph, Mo., are sending out circulars describing the Perfection Water Elevator and Purifying Pump designed for well and cistern. Many features of superiority are claimed for this Pump. Galvanized steel tubing is used. It is light, can easily be lifted out of the well to repair chain, and is stiff and neat. It may be used with either iron or rubber buckets. The large reservoir at the top is referred to as preventing the water from wasting. The bucket used in the Pump is made of a single piece, open hearth steel, double lapped seams, no solder being used. The sprocket chain is another feature specially mentioned.

The recently incorporated American Gas Generating Burner Company, Bowling Green Building, New York City, have completed their organization by the election of George A. Conner, James R. Milliken, William Sutphin, E. J. Morgan and G. N. Goddoine as directors. At a meeting of the Board of Directors George A. Conner was chosen president, William Sutphin secretary and James R. Milliken treasurer. The company have acquired the patents of Mr. Dinsmore, and samples of the proposed manufactures of the company will be placed on exhibition at the office within a few days.

William O'Brien, Red Bank, N. J., has a contract, amounting in value to $1450, for plumbing and installing a hot air heating system in the residence that is being erected in that city for Robert H. McCarter of Newark, N. J. He has also the contract for plumbing a new $65,000 house which is being built at Lakewood, N. J., by H. B. Claflin. This house is to contain nine bathrooms.

Stewart Brothers, Skowhegan, Maine, are to move their plumbing business into one of the new stores in the Merrill Block, now being completed.

James Openshaw, a prominent business man and plumber of Newport, R. I., died at his residence in that city on March 24. He was a member of a number of secret societies and was particularly prominent in his connection with the Odd Fellows.

The American Radiator Company of Chicago are to build a warehouse, 125 x 300 feet, at Nashua, N. H.

The Buckeye Steam Fitting Company have moved to 3-9 Court place, Cleveland, Ohio, and are installing a complete equipment of improved pipe cutting and threading machinery.

James Laraway, Winchester, Mass., is building a new plumbing shop, 50 x 20 feet, which he expects to have ready for occupancy in April.

John Mulrein, formerly engaged in the plumbing business with his brother James on Market street, Poughkeepsie, N. Y., died at his home in Westchester, N. Y., on March 17.

W. Boyd Bratton, Lewiston, Pa., has purchased property on Valley street on which he proposes to erect a three-story brick building for his plumbing business.

An interesting question has been raised in New Britain, Conn., concerning a city ordinance governing plumbing work, and a complaint has been made that the plumbing in one of the new factory buildings has not been properly arranged. The counter argument is made that a factory does not come under the head of a habitation, as mentioned in the ordinance.

The Smart Heating Company of Fulton, Ky., have decided to move their manufacturing plant to Memphis, Tenn.

C. H. Kramer, Allentown, Pa., will move his plumbing business to a new establishment at 34 North Seventh street.

Frederick W. Herrick has been appointed an inspector of plumbing at Boston, Mass., and Frank A. Ingersoll a deputy inspector.

The B. R. Electric Company have been incorporated at Atlanta, Ga., with a capital stock of $5000, which they are authorized to increase to $100,000, to deal in Electrical and Heating Apparatus. The company will probably erect a plant for the manufacture of such goods. G. W. Brine, J. C. Rossman, J. N. Eley and others are the incorporators.

New Firms and Changes.

N. G. Coates & Son are a new firm in the plumbing business, at Findlay, Ohio, Everett Coates having been taken into the firm by his father.

W. P. Hutchinson has purchased a plumbing establishment in Stoughton, Mass.

James M. Campbell has opened a plumbing shop at 419½ Washington avenue, Colorado City, Col.

The Rankin Acetylene Company have been incorporated at Rankin, Ill., with a capital of $2500 by B. R. Cole, J. W. Bond and W. J. Irwin to manufacture Acetylene Lighting Apparatus.

The Thomas Conlin Plumbing & Heating Company of Chicago, Ill., have decreased their capital from $30,000 to $10,000.

Daniel S. Lowe bas opened a plumbing shop at 1333½ Fulton street, Harrisburg, Pa., where he will make a specialty of roofing, tinsmithing and furnace work.

George F. Leahey has purchased the plumbing business of F. H. Paquette & Co., at St. Albans, Vt.

Alderman Thomas F. Nolan, Albany, N. Y., who is an expert in the plumbing and roofing business, has opened an office at 58 Madison avenue in that city.

The James A. Trane Plumbing Company have been incorporated at La Crosse, Wis., with a capital stock of $30,000, by James A. Trane, H. A. Trauche and A. G. Jamesson.

The King Water Heater Company of Wooster, Ohio, have been incorporated with a capital of $50,000.

Charles Beiter has opened a plumbing shop at 225 Washington street, Newport, R. I.

The American Warming & Ventilating Company, Pittsburgh, Pa., have been incorporated, with a capital of $25,000, by Henry L. Williams, Pittsburgh agent of the Wills Warming & Ventilating Company; Joseph E. McGinness of McGinness, Smith & Co.; William W. Dobbins, engineer of the Wills Company; Samuel Garrison and Daniel Ashworth, a well-known mechanical engineer. The company will absorb the Pennsylvania, Ohio and West Virginia territory of the Wills Company, who have many contracts for heating and ventilating school houses and large buildings. A plant will be built at Pittsburgh in the near future.

W. A. Schell of Norwood, Mass., has opened a branch to his plumbing business at Mansfield.

The E. B. Cook Company of Buffalo, N. Y., have been incorporated, with a capital of $25,000, by E. B. Cook, W. M. Moffett and G. F. Smith, to conduct a general plumbing business.

The O. D. Mfg. Company have been incorporated at Syracuse, N. Y., by W. R. Smith, I. A. Weston, Edith P. Smith and Eva M. Weston, with a capital of $20,000, to manufacture Plumbers' Specialties.

The Cline Steam Boiler & Water Heater Company have been incorporated at Brookings, S. D., with a capital of $100,000, by David C. Cline, G. F. MacRae and T. P. Estes.

Patrick Meagher has leased a basement in the Post Office Block at Sanford, Maine, where he will open a plumbing shop.

The Coleman Mfg. Company of New York have been incorporated by W. P. Homans, W. E. Coleman and G. R. Coleman, with a capital of $5000, to manufacture Metal Fans.

C. M. Schwab, president of the United States Steel Corporation, expects to be in Homestead in June, when the C. M. Schwab Manual Training School will be dedicated. Mr. Schwab is defraying the cost for the buildings, and will have a number of guests with him in June for the dedication exercises.

Handsome Metal Ceilings and Side Walls.

The Wheeling Corrugating Company, Wheeling, W. Va., with branch offices in New York, Chicago, St. Louis, Philadelphia and Chattanooga, have issued an attractive catalogue of their productions in the line of sheet metal ceilings, side walls, &c., consisting of a 124-page book, 12 x 10 inches in size, profusely illustrated with half-tone engravings, showing a portion of their long line of stamped sheet metal suitable for ceilings, side walls, cornices, &c. In the introduction the company state that they are continually adding to their already large variety of designs, and that therefore the present publication is designed more to suggest the various styles of their products than to represent the complete line. The first 12 ceilings and side walls, and suggestions as to the selection of designs in order to secure artistic effects. Full directions for applying the metal ceilings, &c., are also contained in the catalogue.



Fig. 1.—Frieze.



Fig. 2.—Ceiling Panel.

Handsome Stamped Metal Ceilings and Side Walls.

pages of the catalogue are devoted to examples of the new Greek pattern stamped work introduced by the concern for the first time this season. The accompanying illustrations show some examples of the handsome designs offered in this line, Fig. 1 representing a Greek pattern frieze, Fig. 2 a ceiling panel, Fig. 3 a cornice complete and Fig. 4 a mold. The combinations produced by these designs are extremely artistic and effective. They are followed by similar goods in Gothic, Oriental, Rococo, Colonial and modern designs, each comprising an extensive variety of patterns of ceilings, wall plates, center pieces, borders, molds, cornices, friezes, beam faces and all kinds of sheet metal goods for interior decoration. The company announce that working plans showing the arrangement of material shipped are furnished in all cases where diagrams of the rooms to be ceiled are given to them. Detailed drawings showing the method of application are also provided. The catalogue contains information in regard to ordering steel



Fig. 3.—Greek Pattern Cornice.



Fig. 4.—Mold.

Discovery of Tin in Alaska.

A material reported by the State Mining Bureau of California, supposed to be tungstate of iron, has proved to be limonite. The material, says the *Engineering and Mining Journal*, was found in the sluices where they had been washing out stream tin. While reticent about the exact locality, they stated it was in Northwest Alaska, somewhere on the Seward Peninsula, on which Nome is situated. It was found over a somewhat extensive area where the men were working certain creeks for gold. When they got any gold they found little or no tin, but on four different creeks they found so much tin that according to their representation each man washed out about 1000 pounds per day. The specimens taken to the Mining Bureau were undoubtedly pieces of stream tin, in the opinion of the chemist of that institution. Should the information as to extent and amount prove authentic, other prospectors in Northwest Alaska will doubtless search for tin hereafter as well as gold. There seems to be little doubt that tin does exist there; but the extent of the deposit is still, of course, entirely uncertain.

Pattern for a Spout Hopper.

A correspondent in Minneapolis, Minn., writes that seeing our advertisement of "The New Metal Worker Pattern Book," he would like to ask whether there is any material difference between it and the one issued in 1892. He would also like to know if it contains a pattern for what he calls a "diamond head," and how to cut such a pattern correctly, sending sketch of the same. It is a short hopper with a rectangular opening at the top horizontally placed, while the lower opening is so placed that the body of the hopper runs obliquely in plan with reference to the sides and the ends of the rectangle and connects with a round pipe below.

Problems of this nature must be solved by triangulation, a subject which is but sparingly treated in the former pattern book. Our new work devotes a separate chapter to the explanation of the principles of triangulation and gives solutions to 55 problems of that class, in several of which (notably problems 176, 180 and 182) the principles involved in the above described form are explained. While our correspondent's sketches are not drawn with sufficient care to justify us in reproducing them in *fac-simile*, he has left no doubt as to the nature of the form they represent. Such pieces in the new work are termed transition pieces because, being usually made to form an intermediate joint or section between two pipes of different plans or profiles, they form a transition from one form to the other, and the principles involved in obtaining the pattern of any such piece are applicable to any other of that class.

If in making the joint at the bottom the vertical pipe is cut off square the lower base of the transition piece will, of course, be a simple circle, but if it is cut off by an oblique plane, making the angle with the inclined and with the vertical portions approximately equal, as in an ordinary elbow, then a little more preliminary work will have to be done before the work of triangulation can be begun. In that case the ellipse produced by cutting the round pipe obliquely will have to be first developed.

In Fig. 1 of the diagrams A B C D represents a plan of the upper rectangular end of the hopper, while F G H J shows the relative position of the vertical pipe with which its lower end is to miter. The proper way to obtain the correct angle of the miter between the hopper and the vertical pipe is to first construct an oblique elevation on a plane parallel to a line joining the centers of the two ends or bases in plan. Therefore, find the center of A B C D, as shown at K, and draw a line from K through the center of the round pipe shown heavy on the plan. Now, at any convenient position below the plan draw a

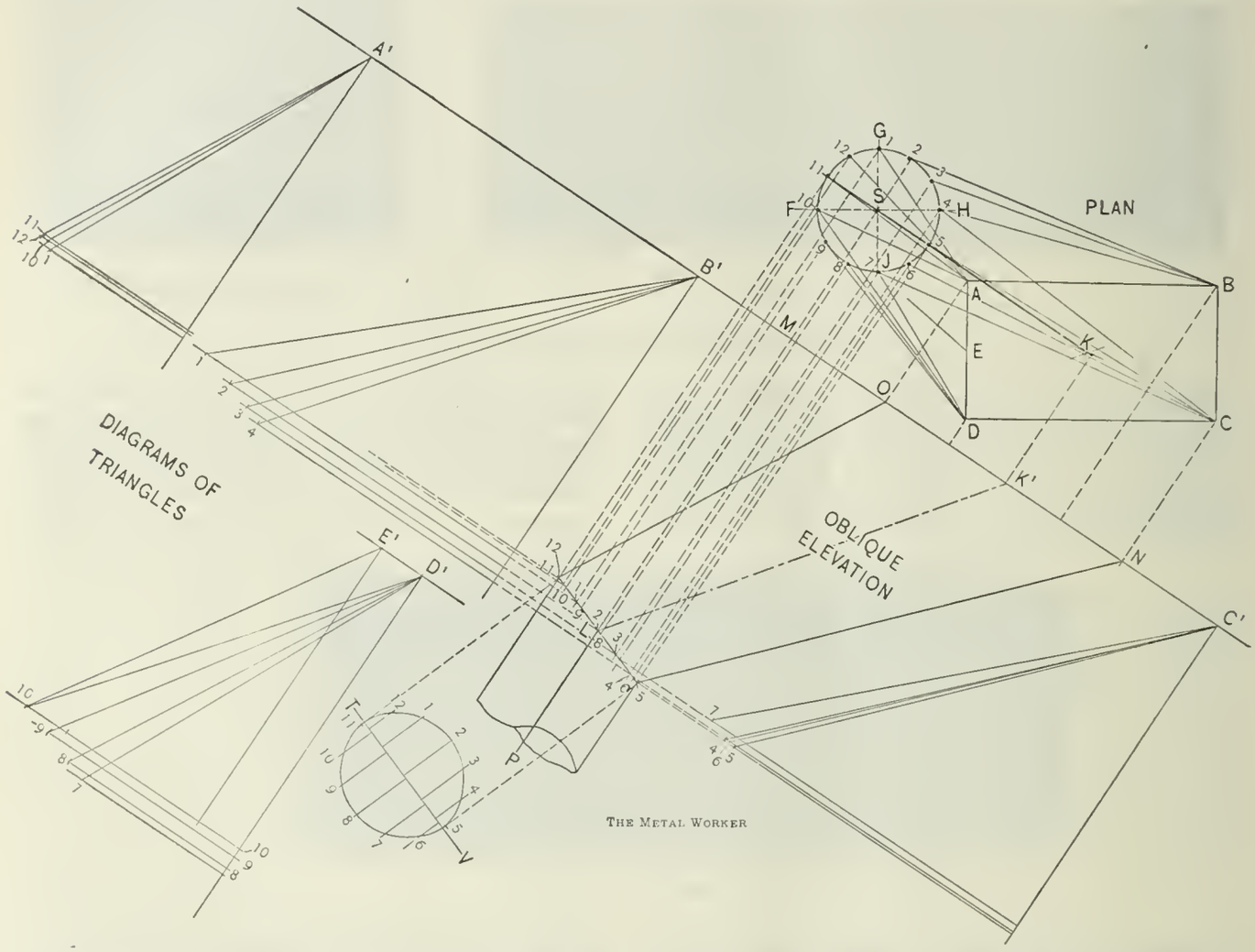


Fig. 1.—Plan of Hopper Shown in Our Correspondent's Diagrams, Indicating the Manner in which the Oblique Elevation and Diagrams of Triangles are Obtained.

PATTERN FOR A SPOUT HOPPER.

line, as M N, parallel to the heavy line, and from each of the points A, B, C, D and K drop lines at right angles to M N, cutting the same, as shown. Also drop a similar line from the center of the round pipe of indefinite length, upon which set off from M N the required vertical hight of the hopper, as shown by M L, and draw L K¹. The angle K¹ L P will then be the correct angle between the vertical pipe and the hopper, and the miter line may now be drawn through L, so as to bisect this angle, just as though both arms of the miter were to be of the same profile. The lines of the sides of the pipe may now be projected from the plan, as shown, and from their intersections with the miter line lines are drawn to the points O and N, corresponding to the angles A and C of the rectangle. This completes the general outlines of the elevation.

In completing the plan and determining the method of triangulation the plan of the round pipe must first be divided into quarters by the lines F H and G J, each quarter of which will form the base of a quarter cone

whose apex is at the corresponding corner of the rectangle. Thus F G S is the base of one-quarter of an oblique or scalene cone, whose apex is at A, while G H S is a quarter of a different scalene cone, having its apex at B. In like manner J S H C and F S J D are the two remaining cones, each of the four differing from the others in the amount of its obliquity or slant. Between the envelopes or outer coverings of these four quarter cones four plane triangles exist whose bases are the four sides of the rectangular base and whose vertices are at the points G, H, J and F; as A G B, B H C, &c. The triangles which form the sides of the transition piece may be said to be inverted with reference to the cones, whose envelopes form the angles or rounded corners of the same.

Now divide each quarter of the plan of the round pipe into any convenient number of equal spaces, as shown by the small figures, and draw lines from the points of division in each quarter to the corresponding apex, as shown. These lines represent in plan the division of each conical surface into three plane triangles, and the true lengths of these lines may be obtained by using them as the base of a series of right angled triangles, whose hypotenuses when found will be the true

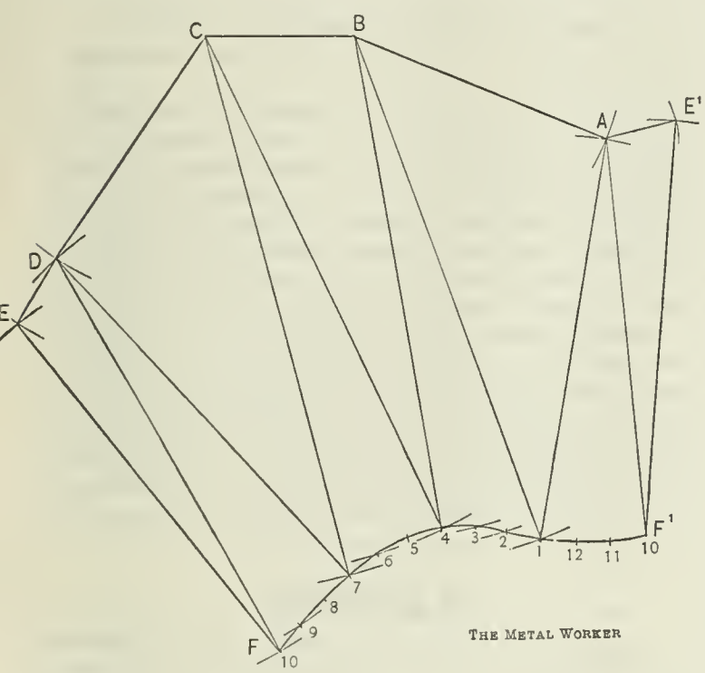


Fig. 2.—Pattern of Hopper Obtained from Fig. 1.

PATTERN FOR A SPOUT HOPPER.

distances as measured between corresponding points of the finished article. These triangles may be most easily constructed by projecting the hights from the oblique elevation, as shown at each side of the same, one group being made for each of the four cones to avoid confusion of lines. First drop lines from all of the points of division in F G H J parallel to M L, cutting the miter line drawn through L, and from the points on the miter line thus obtained draw horizontal lines (parallel to M N) indefinitely to each of the diagrams, as shown. From any points, as A^1, B^1, &c., on M N extended, draw perpendiculars, as shown, cutting the horizontal lines just drawn, and from their intersections with the perpendiculars set off on each the length of corresponding line of the plan. Thus, upon the lines drawn from points 1, 2, 3 and 4 on the miter line set off on each from the perpendicular B^1 the lengths 1 B, 2 B, &c., of the plan, as shown in the diagram, and finally draw 1 B^1, 2 B^1, &c., which distances will be the true distances across the pattern.

Had the vertical pipe been cut off square at L instead of obliquely the lengths of the several lines of the plan would have been set off from their respective perpendiculars upon a single line drawn through L, forming the bases of the several diagrams of triangles, and the hypotenuses drawn as before. In that case also the measurements for the lower edge of the pattern could have been taken directly from the spaces on plan F G H J. But since the oblique section necessarily has a longer perimeter than a right section, a true section on the miter line through L must be obtained.

To develop the section on the miter line first draw any line, as T V, parallel thereto, and from the several points on the miter line drop lines at right angles to T V, cutting the same, and extend them to one side or the other of T V to correspond with the lines of the plan F G H J with reference to the heavy center line. The lengths of the several lines are then made equal to corresponding lines of the plan, when a line traced through the several points thus obtained will give the required section.

To develop the pattern it is simply necessary to combine the dimensions now obtained, those of the elliptical section forming one side of the pattern and those of the plan of the rectangular base forming the other, while the distances across the pattern are taken from the diagrams of triangles. This part of the work will be very briefly described, because many patterns of this class have been given in our columns, and all patterns obtained by triangulation are developed in the same general manner after the preliminary dimensions have been obtained. The pattern may be begun with either of the large intermediate triangles, as that shown by B H C of the plan. First draw C B of the pattern, equal to C B of the plan; then with C^1 4 of the diagram of triangles as radius and C of the pattern as center describe a small arc, which intersect with another arc drawn from B of the pattern as center with a radius equal to B^1 4 of the diagrams, thus locating the point 4 of the pattern. The three adjacent triangles on either side of C B 4 have their apexes at C and B of the pattern. Therefore, from C of the pattern as center describe three arcs whose radii are respectively C^1 5, C^1 6 and C^1 7 of the diagrams. Now from 4 of the pattern as center describe a small arc with a radius equal to 4 5 of the section T V, cutting arc 5, and from the point 5 thus obtained in the pattern describe a small arc with a radius equal to 5 6 of the section T V, cutting arc 6, and establishing the point 6 of the pattern. In the same manner the point 7 of this group is obtained and also 3, 2 and 1 of the group on the other side of C B 4, whose distances from B of the pattern are equal to B^1 3, B^1 2 and B^1 1 of the diagrams. The large intermediate triangles corresponding to the sides C D and B A of the plan are next constructed in the same manner as C B 4, after which the two conical surfaces whose centers are at D and A of the pattern are described in the same manner as those centering at C and B, and the pattern is completed by the addition on either side of one-half of the triangle corresponding to A F B of the plan, the joint being made on the line E F.

THE AMERICAN SHEET STEEL COMPANY WAGE AGREEMENT.

The wage agreement recently made between the officials of the Amalgamated Association and the American Sheet Steel Company is as follows: This agreement, made this 15th day of March, 1902, by and between the American Sheet Steel Company and the Amalgamated Association of Iron, Steel and Tin Workers, witnesseth: That from this date until July 1, 1903, there shall be no change in the present scale of wages, and there shall be no cessation of work by the members of the Amalgamated Association of Iron, Steel and Tin Workers, and there shall be no conferences held at the request of either party; and it is further agreed that clause 3, page 26, and clause 15, page 30, of the present scale be discussed and arranged in conference at an early date.

THE LA BELLE IRON WORKS, Steubenville, Ohio, will shortly make a large increase in their capital stock. This concern have nearly completed the building of a large Open Hearth Steel plant, and have put in operation their Pipe mill for making Lap and Butt Weld Pipe. This concern will furnish Open Hearth Steel to the Pope Tin Plate Company, who are building a 12-mill Tin Plate plant at Steubenville.

The Wheeling Corrugating, Roofing & Cornice Company.

The new plant of the Wheeling Corrugating, Roofing & Cornice Company, Incorporated, at New Martinsville, W. Va., is being pushed with all possible speed. When completed it will be one of the finest and most modern plants of its kind in the country. The conductor pipe department will have a capacity of 200,000 feet per day of round, square, octagon, triangular or twisted pipe. A feature of this pipe will be a patent joint which holds the lengths of pipe securely together. The eave trough made at the plant will be manufactured by a patented process, whereby the trough is made free of twist and perfectly straight. Another feature of the company's product is a patented lap and slip joint, which makes the joints air tight without the use of solder. The capacity of this plant will be 300,000 feet per day.

The corrugating department of the company's plant is being erected from special plans and drawings. The equipment for this department will be the heaviest ever made, having a capacity of corrugating No. 10 gauge plates or a whole bundle of No. 28 gauge at one pass through the machine. Continuous tin roofing will also be made by improved machinery, with the aid of which the sheets are folded, the seams locked and soldered and the sheets painted automatically. By this method, it is claimed, the seams will be at right angles to the sides, so that when a roll is straightened out it will be found to be absolutely straight. The galvanizing plant will be equipped with all the latest improvements used in this country and Europe. The tinning plant will also be of the latest type and will embody a new departure in this line, the sheets being delivered to the sorter automatically after they leave the dipper. By a special process they will be made in exact size. The ends and sides will be at perfect right angles to each other, the waste being trimmed before tinning. There will be no uncoated edges to get rusty, and the plates will also be cleaned by a new process which leaves them entirely free from grease.

The whole plant is arranged to run without overhead belts, thus allowing a clear space for the cranes. The power plant is so arranged that each department or set of machines can be worked independently of the others. The shipping facilities are also up to date, there being 15,000 feet of covered railroad siding, so that no matter how inclement the weather may be the work of shipping will not be affected. In the plan of the works the convenience of the workmen is not forgotten. Washrooms, lavatories, reading and dining rooms are provided for the employees.

The office of the Wheeling Corrugating, Roofing & Cornice Company is located in Wheeling, W. Va., and the officers of the concern are A. A. Horscher, presiden; A. J. Wagener, vice-president; T. G. Cupp, manager, and G. C. Jansen, secretary and treasurer.

Willful Ignorance.

Since the establishment of the American tin plate industry some ten years ago a number of extraordinary statements have been circulated, mainly for campaign purposes, in regard to tin plates, which displayed either crass ignorance of the subject or a set purpose of deceiving those to whom they were addressed. One of the most delicious instances of this kind of "news" that has come under our notice is the following paragraph printed the other day in the *Labor Standard* of Paterson, N. J.:

The tin plate trust is one of the newest infant industries, protected from all competition from abroad, and has a monopoly at home. This baby trust managed to squeeze from the American people last year about $40,000,000 of profits, and this was accomplished by selling sheet iron covered with a composition of lead, which the trust calls tin. Have you noticed since the trust was formed that there is very little real tin on the market?

It is scarcely necessary to inform our readers that such a thing as adulteration of tin plates by lead is absolutely unknown in this country. It is possible that the writer of this brilliant paragraph may have stumbled across some sheets of roofing tin, known as terne plates, which he has mistaken for tin plates.

The British Tin Plate Trade.

Our London correspondent writes under date of March 15 as follows:

Buyers in the tin plate market, especially for export, are now working upon the assumption that before many weeks go by there will be a marked decline in the price of tin plates. The quantity required for South African account will be relatively inconsiderable. The present price is high, but it is argued that several causes operate conjointly or separately to weaken the market. There is no common action, and the withdrawal of orders for the time being may ultimately strengthen the market if makers are able to exercise the requisite patience. But experience has shown that the tin plate manufacturers have not the patience, or, to put it in another way, are much too deeply involved in contracts with the merchants, to wait. One of the difficulties, I might almost say diseases, of the British tin plate trade is the fact that so many of the manufacturers are under the thumb of the jobbers.

Galvanized Roofing for South Africa.

Our London correspondent, writing under recent date, says:

I would like to draw the attention of American exporters to the prospects of galvanized roofing in the near future. Over here it is recognized that prices must stiffen considerably. The war, of course, retards the movement, but it is recognized that South African buyers will before long require many thousand tons monthly for several months after the actual cessation of hostilities, and it is agreed that at the present moment there is not a month's supply at the coast ports. Against this, however, must be set a slight weakening of the market in Australia, but immediately hostilities show signs of coming to a conclusion there will undoubtedly be an abnormal demand for galvanized roofing. Prices will be high, and as shipment from New York or Philadelphia is cheaper than from Southampton, it may well be that with galvanized goods America might make heavy inroads upon the South African market.

FLASHINGS.

The recent reports to the effect that negotiations were under way for the absorption of the American Can Company by the United States Steel Corporation are announced to have been without foundation, at least in the form in which they were circulated. It is fully expected that the Steel Corporation will at some future date take over the Can Company, as the interests of the two corporations are so closely allied, but it is definitely stated that no steps to that end have yet been taken. The annual report of the American Can Company, which will be presented next month, the company having completed their first year on March 31, is awaited with considerable interest. It is said that any action by the United States Steel Corporation is likely to be contingent upon the showing made by the Can Company.

The Eastern Expanded Metal Company, 42 Court street, Boston, Mass., have the contract for constructing a power house and a casting shop for the Winchester Repeating Arms Company at New Haven, Conn.—one 34 x 60 feet and the other 54 x 89 feet, both one story high. The system of construction provides for a steel frame covered with Metal Lathing, which in turn is covered with concrete, which does away with the brick and timber and makes a very durable and substantial structure.

W. F. Bonnell of Otis Bonnell & Co. has been sent to Europe as a special commissioner for the Independent Sheet Steel Manufacturers' Association, to negotiate for the purchase of foreign made Steel Billets. It is said that orders for about 40,000 tons will be placed with English and German manufacturers.

The Toledo Machine & Tool Company, Toledo, Ohio, report an increasing demand for Dies, Punch Presses

and other Sheet Metal Machinery. Although the company have made large additions to their equipment during the past three years they are unable to keep pace with their orders and have recently added six large lathes, a heavy combined vertical and horizontal milling machine and a large Beaman & Smith horizontal milling and boring machine.

The Missouri Sheet Iron Works Company of St. Louis, Mo., have been incorporated with $20,000 capital to operate a stamping plant. E. N. Tolkacz, M. Tolkacz and M. Thiet are the incorporators.

Work is being rapidly pushed forward on the new plant of the Griffiths Charcoal Iron Mills, at Washington, Pa., and it is expected that the plant will be completed by July 1. The knobbling and charcoal furnaces are now being erected.

The Metal Ware Mfg. Company, with a capital stock of $20,000, have been incorporated at Louisville, Ky., for the manufacture and sale of articles made from Sheet Iron and Tin Plate. Wm. T. Hale and J. J. Morris of Louisville and G. G. Summers of New Albany are the incorporators.

The J. R. Bryant Cresttile Conductor Company, Crawfordsville, Ind., favor us with a 46-page catalogue and price-list illustrating and describing the roofing specialties which they manufacture. The company call particular attention to their combined Cresting, Ridge Board and Electric Conductor, which is named the Cresttile Conductor. This is not only an ornamental Cresting, but is a Ridge Board as well, affording perfect protection to the comb of the house and further forming an electric conductor, as it can be attached to the valleys at the top of the house and thus, by means of the water spout and a metal ground connection, make a perfect lightning conductor. Other styles of Cresting and ornamental Ridging are shown in numerous patterns. The company also manufacture Galvanized Cornice Moldings, Ridge Rolls, Roof Gutters, Valleys, Eave Trough, Miters, Conductor Pipe and other Roofing Supplies. They are manufacturers of special styles of Roofing, such as Self Cap, Crimp and Roll Cap. They further offer to the trade Pressed Steel Brick, Steel Weather Boarding, Paneled Steel Ceilings, Weather Vanes, &c.

The Packers' Sanitary Can Company, 100 Broadway, Paterson, N. J., have been incorporated with a capital stock of $500,000, to manufacture Tin Cans. William C. Bryant, Edward J. Norton, Alonzo Brymer, Robert J. F. Pollitt and John Murphy are the incorporators.

The James H. Watson Estate, Crawfordsville, Ind., have issued an interesting 56-page illustrated catalogue, covering the specialties which they manufacture, consisting of Galvanized Conductor Pipe, Galvanized Elbows and Shoes, Conductor Hooks, Eave Trough, Roof Gutters, Crown Moldings, Galvanized Ridging, Roof Cresting, Finials, Vanes and other supplies for roofers. The illustrations of Finials and Cresting cover a great variety of designs, running into exceedingly elaborate and ornamental patterns. Attention is particularly called to a patent Galvanized Ridge Roll and Cresting combination which is made in one piece, with no rivets or solder, in 10-foot lengths, without cross seams, and in two sizes —namely, 8 and 10 inches in hight. The concern are prepared at all times to name special prices on all kinds of Metal Roofing, including Corrugated Steel, both galvanized and painted.

The Grahl-Petersen Company have been incorporated at Omaha, Neb., with a capital of $10,000, to manufacture Tin and Iron Ware and to do a roofing business and general sheet metal construction work. They will occupy a new building to be erected south of the Merriam Block, between Main and Pearl streets. The incorporators are C. B. Grahl, H. H. Grahl, Theodore N. Petersen, H. D. Petersen, John Stange and Henry L. Schoening.

J. M. Kelly succeeds to the business of Brand & Kelly, 1727-1729 Stout street, Denver, Col., and will continue to do sheet metal work and make a specialty of hot air furnace heating and ventilating. G. Brand has retired from the firm on account of ill health.

W. J. Burton & Co., manufacturers and jobbers of Tinners' and Roofers' Supplies, at Detroit, Mich., have secured two three-story buildings adjoining their present buildings. This increases their floor space two and one-half times, the addition being made necessary by their increased business.

The F. A. Wendell Heating & Plumbing Company of Newton, Mass., have established a Tin Roofing and Conductor department in conjunction with their business.

Work on the excavations for the new plant of the Rolling Mill Company of America at Connellsville, Pa., is progressing rapidly and the construction of the mill buildings will begin very shortly.

H. H. Dickey, president of the Maryland Sheet & Steel Company, Cumberland, Md., has purchased the South Cumberland plant of the American Tin Plate Company, and has organized the Maryland Rail Company, with a capital stock of $50,000, to assume control of the property and operate it for the manufacture of Steel Rails. The new company are overhauling the plant preparatory to starting operations about May 1. The officers and directors are: H. H. Dickey, president; A. F. Baumgarten, vice-president; William C. Dickey of New York City, secretary; H. E. Weber, treasurer, and Nathan A. Taylor of the N. & G. Taylor Company of Philadelphia. Messrs. Baumgarten and Weber are respectively vice-president and secretary and treasurer of the Maryland Sheet & Steel Company.

The Stark Rolling Mill Company, Canton, are having plans prepared for a new Bessemer converting plant. Originally plans were drawn for the erection of two 35-ton open hearth furnaces, but it seems probable that the Bessemer plant may take their place.

The recently incorporated Southern Metal Company, Orangeburg, S. C., manufacturers of Steel Ceilings, Galvanized Iron Cornices, &c., have their plant, 80 x 125 feet, in operation, with plenty of work on hand and bright prospects for a good season. The officers are W. S. Barton, president; D. J. Hydrick, secretary and treasturer, and J. B. Outland, manager.

The Monarch Iron & Steel Company of Pittsburgh have been incorporated under the laws of Delaware, with a capital of $100,000. The concern propose to erect a plant at Parkersburg, W. Va., adjoining that of the Parkersburg Iron & Steel Company, to make Planished Iron Sheets.

The six-mill Sheet plant of the Ashland Steel Company, Incorporated, at Ashland, Ky., will be ready to start in from three to four weeks.

The Tuscora Steel Company, Newcomerstown, Ohio, have placed two mills of their new Sheet plant in operation and were to start up the third this week. The Tuscora Steel Company were organized last spring, with a capital stock of $200,000, and shortly thereafter broke ground for the erection of a four-mill Sheet plant and galvanizing plant. The product will be Black and Galvanized Sheets. The equipment was mostly furnished by the International Power Company of Worcester, Mass.; Braddock Machine & Mfg. Company, Braddock, Pa.; Case & Co. of Columbus, Ohio; Otis Steel Company of Cleveland, and Keystone Mfg. Company of Erie, Pa.

Edward Atkinson, president of the Boston Manufacturers' Mutual Fire Insurance Company, suggests that one or two large or jumbo sprinkler heads be put near the foot of the elevator or belt shafts, in such position as to throw a heavy volume of water directly upon the chief motors and at points where grease may be scattered so as to become dangerous. The bearings of every large high speed fan should be guarded by sprinkler heads in the same way, as they are very liable to become heated. The expense of this safeguard will be very slight. The large sprinkler heads can be supplied by the General Fire Extinguisher Company, by the Walworth Mfg. Company or by the Estey Sprinkler Company.

THE LETTER BOX.

Inquiries in regard to practical questions of general interest are invited, in reply to which we shall be glad to receive suggestions and information from our readers.

Correspondents are requested in all cases to give their names and addresses, which will not, however, be published or disclosed without their consent.

QUICK HEATING BOILER CONNECTIONS.

From S. L. R., Newark, N. J.—Will *The Metal Worker* kindly explain to me which is the best method of heating water in an upright boiler, so as to secure hot water quickly? I ask for this information with a view to learning whether the provision of more and differently located openings in the sides of the boiler will be an improvement. The ordinary upright boiler has but four

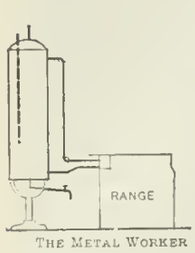


Fig. 1.—Proposed Connection.

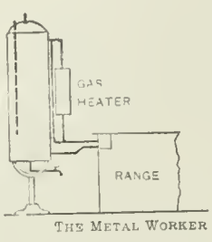


Fig. 2.—With Gas Heater.

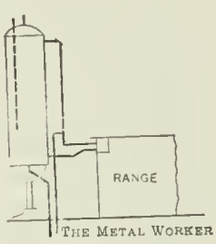


Fig. 3.—Multiple Connection.

Quick Heating Boiler Connections.

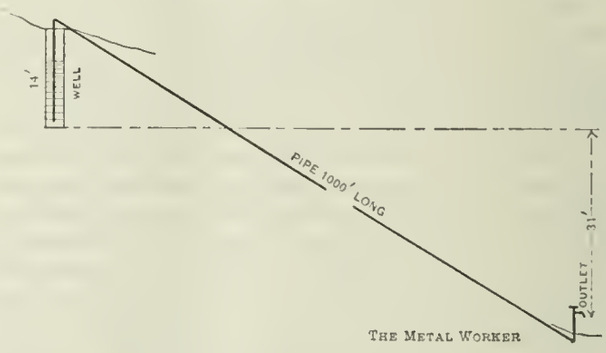
holes, while I would suggest five—two on the top, as usual; one in the bottom for cleaning and emptying purposes, and two on the side for circulating purposes. I would place the lower side opening 4 inches above the bottom, so that it will be well up above the sediment, and one about 6 inches from the top of the boiler, so that the heated water can enter without having to pass through a body of cold water to lower its temperature and destroy its usefulness until all of the water in the boiler was heated. These changes would in no way reduce the storage capacity and would enable hot water to be procured much more quickly when connected by this method. It is well known that when a large quantity of water is drawn from the boiler, as on wash days, the water in the boiler will become practically cold, and some time must elapse before hot water can be procured by the old method. With the method suggested the hottest water will be that which comes back from the water back, and, as it does not have to pass through a body of cold water, a much more continuous supply of hot water will always be provided at the top of the boiler to be drawn upon. The boiler will be connected with the water back as shown in Fig. 1, so that hot water can be drawn in a short time after the fire is started. A method of connecting a gas heater is shown in Fig. 2, which does away with the clumsy connection with the hot water pipe at the top of the boiler. Two water backs, or a water back and a water heating coil in a furnace, can be connected with the boiler, as shown in Fig. 3. Are the changes in the location of the boiler openings of sufficient advantage to make it advisable to have boilers made in this way by a manufacturer?

Note.—We shall be glad if our plumbing readers will give their views on this subject. In the mean time, we would suggest that it is always difficult to get the trade to give up the use of apparatus or methods that have been so long and firmly established as the kitchen boiler and the location of its openings. It is probable that some benefit may be derived from the suggested lower connection at the side, which would enable the sediment to settle at the bottom of the boiler and not be carried through the water back in circulation. On the other hand, should steam be generated in the water back the commotion which would naturally ensue would be very likely to stir up sediment, yet not to the extent of carrying the sediment round into the water back, as would result from a similar stirring up when the pipe comes from the bottom of the boiler. It is doubtful, however, if the upper connection has very much to recommend it, inasmuch as the hot water pipe can be carried over and connected with the hot water service pipe and the same result be accomplished, even though the connection may not be considered so graceful in appearance. Numerous boilers have been constructed different in some details from those in general use, but the effort has never been attended with any considerable success. The standard form of construction is still in the largest demand in all sections of the country.

WILL THE SIPHON WORK?

From A. W. K., Lewisburg, W. Va.—I shall be glad to have the opinion of *The Metal Worker* as to whether a siphon, arranged as shown in the sketch, will operate. I want to draw water out of a well 14 feet deep through a pipe about 1000 feet long which has a gradual descent until the outlet is 31 feet lower than the bottom of the well. Will the siphon draw water successfully under such conditions? If so, where should a pump be placed to start it, and what size of pipe will be best to use?

Answer.—There should be no difficulty about a siphon drawing water under the conditions mentioned if the piping is properly arranged. It has been the experience of those who have laid such pipes that lead pipe gives the least trouble from corrosion and from allowing air to enter through it. The size of the pipe will be governed by the quantity of water desired. As small a pipe as ½-inch may be used, but there will be less likelihood of stoppage and a better flow, owing to the long length of the pipe, through a pipe of larger diameter. The difficulty in operating such a siphon is due to the liberation of air, which all water contains. If this air is liberated in the pipe it will accumulate in the crown of the siphon and stop the flow. In consequence it is well to run a pipe from the highest point in the siphon, with a stop cock near the siphon, up to some accessible point. Sometimes a funnel is connected with this pipe, and when the stop cock is open the siphon can be started by filling the long pipe through the funnel, which will allow the air to bubble up through the water and the water to run into the crown of the siphon and fill it. If this device is connected with the siphon a pump will not be necessary to start it. It will only be necessary to stop the lower end of the siphon until the long pipe is filled with water, when the flow of water through the long pipe or the long leg of the siphon will start it to work.



Will the Siphon Work?

WHAT CAUSED THE FIRE?

From D. B. M., Springfield, Mass.—Noticing the inquiry of "J. B. E." in *The Metal Worker* of March 22 I would ask, did not the furnace stand in a close room, and was not the fire due to the want of good circulation of air? Three or 4 inch holes would have been better than 2½-inch holes in the casing, and it would have been still better to have raised the furnace 4 inches above the floor without any holes. To have made it safe, one course of brick laid in cement or sand would have been safer than the iron and asbestos. I have tried both and now always use brick and cement.

From Lack of Air, Buffalo, N. Y.—In his letter in *The Metal Worker* of March 22 "J. B. E." says there

were three layers of asbestos and one of iron. The asbestos, as well as the iron, will heat hot enough to carbonize the wood floor, and just as soon as the action has gone far enough to break through the floor the natural up draft of air through the casing would start the blaze. The ashes in the stove at the time of the fire had little to do with it, as the carbonizing started as soon as the stove was put up. The safest way is to provide an air space between the floor and the iron, or two pieces of iron with a space between, or 2 inches of very fine sand between the floor and the iron. In our boat work, where we put a big range into very close quarters, we always rely on the air space. We know of one case in Buffalo where a hotel floor caught fire through three courses of brick and ¼ inch of wrought iron plate set solid on the wood.

SOFTENING A GRINDSTONE.

From W. A. K., Garnaville, Iowa.—Will some reader of *The Metal Worker* kindly tell me, through the Letter Box, the best way, if there is any, of softening a grindstone? Most, if not all, grindstones sold by local dealers are too hard.

A New Trade School.

On Wednesday evening, March 26, the new Lucas A. Steinam School of Metal Working, which has been erected as an adjunct to the Hebrew Technical Institute at 225 East Ninth street, New York City, was formally opened. The school has been built and equipped at an expense of $100,000 by Abraham Steinam and his wife in memory of their son, Lucas Steinam, who died a year or two ago. The dedicatory exercises were attended by Mayor Seth Low, Borough President Jacob A. Cantor and Jacob H. Schiff, representing the Board of Trustees of the Hebrew Technical Institute.

The new building is a six story and basement structure of brick and granite, forming a wing of the Hebrew Technical Institute. In the basement is a heating and lighting plant for both buildings. On the first floor is an assembly or lecture room, with a seating capacity of 250. The second floor is occupied by a machine shop, equipped with benches and vises for hand work, lathes, planing machines, milling machines and other tools, while the third floor contains a pattern making and wood turning shop. On the fourth floor is a joinery shop, and on the fifth floor a mechanical drawing room and two class rooms. The sixth floor contains a forge room and a molding and casting shop. The school accommodates 250 boys, who are taught the carpentry trade, forging, metal working, mechanical drawing and mathematics. The course extends over three years. At the end of the time the pupils are graduated, after successfully passing the examinations, and receive certificates of competency. The Steinam Memorial School will be under the general management and supervision of the directors of the Hebrew Technical Institute.

Aluminum.

Aluminum, says Professor Wilson in a paper recently read before the British Association, does not exist uncombined in the metallic state, being essentially a product of chemical industry. Aluminum can be used to produce an enormous number of alloys, some of which, containing 1 or 2 per cent. of other metals, combine the lightness of aluminum with greater hardness and strength. On the other end of the scale alloys containing from 90 to 99 per cent. of other metals exhibit properties of those metals, but much improved for certain purposes: Unfortunately it is when aluminum is used alone that its chief recommendation—lightness—is found to be counterbalanced by other considerations. The efforts that have been made to use aluminum wire for telegraphs and telephones have not been very encouraging, owing to the uncertain texture and weakness of the drawn wire. The same difficulty occurs with tubes and sheets of the metal. No guarantee of strength can be obtained from the manufacturers short of thickness far in excess of what would be required of copper and still harder and tougher alloys. There is consequently no advantage in using the lighter but more uncertain and costly metal. The chief advantage of commercial aluminum appears to be for the construction of cooking utensils. A great difficulty is found in soldering the metal; and it will not stand salt water. On the whole, therefore, aluminum must be classified by practical men as a disappointing metal.

City Garbage Used for Illumination.

The Borough Council of Bermondsey, one of the most thickly populated districts of London, has recently brought to completion a new electric lighting and garbage destructor plant, which is claimed to be a great success. The works are situated on the Spa Road, near the Bermondsey Town Hall, and occupy about 1½ acres. The buildings consist of a destructor house, an engine room containing the generating plant, a pump and fan room, an accumulator room and offices. The destructor house is specially designed with the view of giving adequate ventilation. It consists of six cells, each having 26 square feet grate area, and capable of destroying 50 tons of refuse in 24 hours. The refuse to be destroyed is brought in by the collecting vans, conveyed along an inclined roadway to a tipping floor at the back of the destructors, and discharged into spacious bins placed over the tops of the cells, from which the latter are fed as required through rectangular shoots. After passing through the shoots the refuse is deposited on a hearth at the back of the furnace, and is there thoroughly dried before the actual burning takes place. By these means the refuse is rendered more combustible and the vapors which are given off become innocuous by being passed over the hottest part of the furnace. The gases from the cells pass out at the front and come into contact with the boiler tubes, and are thus utilized for the purpose of raising steam. Each cell and boiler furnace is fitted with forced draft apparatus.

In deciding the system of distribution most applicable to Bermondsey, the engineers had under consideration the fact that the district is very concentrated and is filled with factories and workshops, and that the most favorable opportunity occurred for supplying electricity during the day time for motive power purposes. The alternate current system was therefore not deemed so suitable as the continuous current, which has been adopted. The plant at present installed in the generating station consists of three multipolar generators. Two sets each have an output of 150 kw. at 480 to 520 volts, and the third set an output of 75 kw. at 480 to 520 volts. The battery, which consists of 280 cells, is capable of giving a discharge of 83 amperes at 510 volts for six hours, or on an emergency 300 amperes for one hour. The switch board has been designed to control three dynamos, six feeder circuits, eight arc circuits, the Town Hall, the depot and station lighting and power circuits, the storage battery, &c. In the borough the three-wire system of mains has been adopted, and the feeder mains are at present four in number. With regard to the public lighting, there are at present 71 standards erected, supporting 10-ampere double carbon arc lamps and incandescent lamps. At 12 o'clock every night the arc lamps are permanently turned out and the incandescent lamps are lighted. The charge for electric lighting is 12 cents for the first hour and 6 cents for each hour afterward, based on the minimum demand system. For motive power purposes the charge is 5 cents per unit. The question of the disposal of the residuum from the destructor has occupied the attention of the Council, and an electrically driven hydraulic plant for the manufacture of flags from a portion of the clinker had been laid down. That machine will turn out flags at the rate of 25 per hour at a very low cost. The clinker is ground very fine, mixed with a due proportion of cement, thoroughly incorporated, and then subjected to a pressure of 1000 pounds per square inch and afterward allowed to dry.

Reports from England state that 30,000 tons of Russian foundry iron have been sold for shipment to this country and that an export bounty is paid on this iron.

TRADE REPORT.

MARKET SUMMARY.

Pig Tin is easier, with demand very quiet.

Copper continues quiet and is somewhat weaker in price.

Pig Lead is dull, but steady in price.

Spelter rules very firm, with a light volume of business.

Antimony is unchanged.

Nickel is without change in price and in good demand.

Aluminum is active at unchanged prices.

Tin Plates are quiet and firm.

Sheets are still in active demand; jobbers' prices are rather lower.

Old Metals are in good demand, with prices firm.

Foundry Iron is still scarce and prices have an upward tendency.

Sheet Copper is in good demand and firm in price.

Sheet Zinc is without change.

Hardware is moving actively and prices are firm, with upward tendency in some lines.

Plumbers' Supplies are in good demand; prices show much firmness.

Cast Iron Steam Fittings will be advanced; prices have been withdrawn by manufacturers.

Wire Nails are scarce, with demand improving and prices firm.

Cut Nails are in fair demand at unchanged prices.

Window Glass prices are expected to advance next month.

Step Ladders have been marked up 1c. per foot.

Linseed Oil is stiffening, with likelihood of advance.

Spirits Turpentine has advanced 1½c. per gallon.

Rosin prices are somewhat higher.

METAL MARKET.

NEW YORK, March 28, 1902.

Pig Tin.—Early in the present week spot Tin advanced sharply, but, as a result of freer arrivals, an equally sharp decline followed, and the market closed with an easy tone, due to absence of demand. Available supplies are light and sellers hold spot Tin steady at previous quotations. The volume of transactions, however, was very light. Jobbers' prices are unchanged, Straits Pig in small lots being quoted at 27½c. to 28c. per lb.

Copper.—The Copper market is weak and wholesale prices have gone off a fraction since last week. Very little business is being transacted, as consumers still show no disposition to enter the market, being evidently supplied with metal purchased some time ago on contract. Retail prices are unchanged. Lake Ingot in small lots is quoted at about 13¼c. to 13¾c. per lb., and Casting Copper at 13c. to 13¼c.

Sheet Copper.—A good consumptive demand continues for Sheet Copper. Buyers, however, are purchasing mainly in a hand to mouth way, and are taking only such amount of stock as they can readily use. Prices are steady on the basis of 18c. per lb. from store.

Pig Lead.—The situation in the Pig Lead market is without change. Business is dull and uninteresting. Prices are firm, American Pig in small lots being quoted at about 4.45c. to 4½c. per lb. Advices from St. Louis report the conditions in the Pig Lead market there to be quiet, with prices on a firm basis.

Spelter.—Spot Spelter is still scarce and the market is very firm, though quiet. Jobbers quote Western brands in small lots at 4.60c. to 4.70c. per lb. St. Louis advices report the market for Spelter to be fairly active, with a very substantial demand and light offerings.

Sheet Zinc.—A moderate demand for Sheet Zinc is reported. Prices are unchanged at 6¾c. per lb. for 600-lb. cask lots, and 7c. to 7¼c. for smaller quantities.

Antimony.—This metal shows no change. Hallett's is quoted at 8⅝c. to 8¾c. per lb. in small parcels; U. S. at 8⅜c. to 8½c., and Cookson's at 10¼c. to 10¾c.

Nickel.—There are several unconfirmed rumors regarding new developments in the Nickel industry. One report has it that the Canadian Copper Company and the Orford Copper Company, who refine the Canadian product, are to become affiliated with United States Steel Corporation interests. Another rumor says that the Orford Copper Company, Canadian Copper Company and the Nickel Corporation of London are to be consolidated. It is a fact that a movement of some sort is on foot. Details are, however, not divulged. Prices are unchanged, small lots being quoted at about 55c per lb.

Aluminum.—No change has taken place in prices or in the volume of business, which continues good. Small lots of No. 1 Ingot guaranteed 99 per cent. pure are quoted at 37c. per lb., and 100-lb. lots at 35c.

Tin Plates.—There was no change whatever in the Tin Plate situation during the week. The only feature of interest was the announcement made by the American Tin Plate Company that orders at present prices will be accepted on purchases for delivery up to the end of the third quarter of the year. Deliveries on former contracts are being made in considerable volume, but the amount of new business is said to be rather light. Prices are steady and unchanged. American Bessemer Coke Plates, IC, 14 x 20, are selling in small lots at about $4.85 to $5 per box at New York and corresponding points.

Sheets.—The demand for both Black and Galvanized Sheets is still very active, that for Galvanized being heavier than for Black, but the market on both is very firm. Most of the mills have all the orders they can fill in the next two or three months, and it is regarded as almost certain that great difficulty will be met with in making deliveries promptly. Jobbers' prices have softened slightly on more liberal receipts from mills. No. 27 One Pass Cold Rolled Soft Steel Sheets, in small lots, delivered at New York or corresponding points, are quoted at 3.85c. to 3.90c., and Galvanized Sheets at 70 per cent. to 70 and 2½ per cent. off the list.

Chicago advices are as follows: A fair demand is noted for Black Sheets, but a heavy business is doing in Galvanized. Mills are making reasonably good delivery on Black Sheets, but orders booked are evidently satisfactory, as prices are well maintained. Sheets of heavy gauges are scarce and mills are much in arrears. Jobbers quote small lots at 3.35c. to 3.45c. for No. 27 Black, and 70 and 5 for Galvanized.

St. Louis advices are as follows: A good active market for Sheets of all grades is to be reported and prices are on a firm basis. Jobbers quote Stove Pipe size, No. 27, at 3.60c. to 3.65c., and Galvanized Sheets, 70 to 70 and 5 off in round lots.

Old Metals.—A slight letting up is noted in the urgent demand for Scrap Iron, but prices still hold firmly. Old Metals of other descriptions are moving in good volume at unchanged prices. Dealers are paying about the following rates for moderate sized lots, delivered at New York or corresponding points:

Heavy Copper	per lb. 11¼c.
Light and Tinned Copper	per lb. 10 c.
Heavy Brass	per lb. 8¾c.
Light Brass	per lb. 6½c.
Lead	per lb. 3¾c.
Tea Lead	per lb. 3⅝c.
Zinc	per lb. 3 c.
Pure Aluminum Sheet	per lb. 25 c.

Cast Aluminum	per lb. 20 c.
No. 1 Pewter	per lb. 15¾c.
No. 2 Pewter	per lb. 9 c.
Tin Plate Scrap, per gross ton	.... to $5.00
Wrought Iron Scrap, per gross ton	$13.50 to 14.00
Heavy Cast Scrap, per gross ton	12.50 to 13.00
Stove Plate Scrap, per gross ton	9.50 to 10.00
Burnt Iron, per gross ton	7.50 to 8.00

THE PIG IRON MARKET.

NEW YORK.—The local market is quiet and very firm. For the third and fourth quarter Lehigh Valley and Schuylkill Valley furnaces are asking $18 at furnace for No. 2 Foundry, equivalent to $18.65 tidewater, while for early delivery considerably higher figures are being realized. Prices abroad are too high to allow importations at the present time. The Southern furnace interests held a meeting in this city this week and reaffirmed the price schedule for Western delivery. A movement to advance the price was given up. We quote for forward delivery, Northern Irons: No. 1, $19.50 to $19.75; No. 2 X, $18.50 to $18.75; No. 2 Plain, $18 to $18.25, at tidewater; Tennessee and Alabama brands, No. 1 Foundry, $16.75 to $17; No. 2 Foundry, $16.25 to $16.75; No. 1 Soft, $16.75 to $17; No. 2 Soft, $16.25 to $16.50; No. 3 Foundry, $15.50 to $15.75; No. 4 Foundry, $15 to $15.50.

CHICAGO.—All kinds of Spot Iron are in sharp demand at fancy prices, and a fair business has been done in Foundry Iron for delivery in the latter half of the year. The local furnace companies have advanced prices another 50 cents, but the Southern companies have not advanced their schedule, although most of them will take no more orders. Some are getting $1.50 per ton above their schedule. An important step was taken last week by the Southern companies in changing their ton from 2268 pounds to 2240 pounds. We quote as follows:

Lake Superior Charcoal	$21.00 to $22.00
Local Coke Foundry, No. 1	19.00 to 19.50
Local Coke Foundry, No. 2	18.50 to 19.00
Local Coke Foundry, No. 3	18.00 to 18.50
Local Scotch, No. 1	19.00 to 19.50
Ohio Strong Softeners, No. 1	20.10 to 20.35
Southern Silvery, according to Silicon	16.90 to 18.65
Southern Coke, No. 1	16.40 to 18.15
Southern Coke, No. 2	15.65 to 17.15
Southern Coke, No. 3	15.15 to 16.65
Southern Coke, No. 1 Soft	16.40 to 18.15
Southern Coke, No. 2 Soft	15.65 to 17.15

PHILADELPHIA.—The situation has not improved, from the buyers' standpoint, and prompt Iron is harder to get than it has been at any time during the year. Prices are gradually being worked up to a higher level, and it is impossible to give exact figures, as every seller makes his own price, but $19 would be an inside rate for No. 2 X Foundry, with some sales at $19.50 to $20—the latter figures for April and May, and the former for June and July. For the last half of the year, probably $18 to $18.50 would be considered a fair quotation. Several leading concerns have stopped quoting for the present, being sold close up to midsummer, and with a fair sprinkling of orders on their books for the later months. It is believed that prices will be no higher, but any forecast as to the future would be but mere guesswork. At the present time the following figures represent the market as nearly as possible for deliveries in this and nearby districts:

	Deliveries to July.	Deliveries July to December.
No. 1 X Foundry	$20.00 to $21.00	$19.00 to $20.00
No. 2 X Foundry	19.25 to 20.00	17.50 to 18.00
No. 2 Plain	18.75 to 19.00	17.00 to 17.50

PITTSBURGH.—The Pig Iron market continues very firm. Furnaces are now getting almost a full supply of Coke, and the output of Pig Iron in March will be much heavier than in February. There is an active demand for Foundry Iron, the foundries being full of work and using more metal than ever before. Prompt Foundry Iron is very scarce and brings premiums over prices on contracts for extended delivery. The market is somewhat difficult to quote, but No. 2 Foundry may be said to rule at $18.50 to $18.75 on contracts for extended delivery, with prompt Iron at $19.50 to $20, delivered.

ST. LOUIS.—The Pig Iron market maintains a firm tendency, but the volume of demand has slackened considerably and except in the matter of inquiry for material for the second half of the year orders are on a light scale. Any spot Iron that may be on the market is snapped up and at advances from quotable prices. Shipments are coming forward slowly, and much complaint is heard on this score. We quote for cash, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry	$16.00 to $16.50
Southern, No. 2 Foundry	15.25 to 15.75
Southern, No. 3 Foundry	14.75 to 15.25
Southern, No. 4 Foundry	14.25 to 14.75
No. 1 Soft	15.75 to 16.25
No. 2 Soft	15.25 to 15.75

CHICAGO REPORT.

Scrap Iron and Steel.—The supply is increasing and the advancing tendency has been checked. We quote dealers' buying prices for carload lots, Chicago delivery, as follows:

	Per net ton.
Country Wrought Scrap	$14.00 to $14.50
Machinery Cast	13.00 to 13.50
Malleable Cast	12.00 to 12.50
Stove Plate (free from burnt)	10.00 to 10.50
Burnt Iron and Grate Bars	8.00 to 8.50
Sheet Iron and Hoops	8.00 to 8.50
Plow Steel	11.50 to 12.00
Breaking Stock	.... to 11.00
Old Boilers—whole (Iron)	9.50 to 10.00
Old Boilers (Iron) cut in single Sheets and Rings	12.00 to 12.50
Old Gas Pipes and Boiler Tubes	12.00 to 12.50
Cast Borings	7.00 to 7.50
Turnings	11.50 to 12.00
Horseshoes	14.00 to 14.50

Old Metals.—Consumers are freely buying stock. Dealers quote buying prices on small lots as follows:

	Per lb.
Copper Wire and Heavy	11½c.
Copper Bottoms	10½c.
Copper Clips	11 c.
Red Brass	11½c.
Yellow Brass	8 c.
Red Brass Borings	9 c.
Yellow Brass Borings	7¼c.
Light Brass	7 c.
Pipe Lead	3.87½c.
Tea Lead	3.35c.
Zinc	3.10c.
Tin Foil	19 c.
Pewter, No. 1	16 c.
Pewter, No. 2	10 c.
Aluminum	20 c.

Old Rubber.—Trade is dull and prices are not strong. Dealers' buying prices are as follows:

	Per net ton.	Per lb.
Garden Hose	$25.00	.....
Air Brake Hose	42.50	.....
Rubber Shoes	....	6¾c.
Rubber Car Springs	....	5 c.
Inside Bicycle Tubing	....	22 c.
Outside Tubing	....	6½c.
Black Rubber	....	4 c.
White Rubber	....	8¼c.

Rags.—The trade is still looking for a decline. Dealers quote buying prices of good Country Mixed Rags, Chicago delivery, at 70c. to 75c. per 100 lbs. in any quantity.

Anthracite Coal.—Business will be quiet until the new spring schedule is announced. Prices are as follows:

	Grate.	Egg and Stove.
Chicago	$5.75	$6.00
Milwaukee, Wis	5.75	6.00
St. Louis	6.20	6.45
Kansas City, Mo	8.25	8.50

THE HARDWARE TRADE.

The coming of decided spring weather has had the effect of stimulating business, as merchants are entering upon more active and definite preparations for the season's business. Reports from travelers are almost uniformly of a cheerful tenor, and their order sheets cover a variety of goods in entirely satisfactory quantities. Prices are firm, with something more of an upward tendency than is regarded as entirely healthful by many in the trade. On account of the condition of the Iron market advances in some of the finished products, especially those into which Iron enters largely, have been found necessary, and the announcement of higher prices in such goods is a feature of the situation. Many of the manufacturers are unable to turn out goods as promptly as their customers desire, a fact which not only reflects the large volume of business, but is explained as caused by the difficulty of obtaining raw material, the factories being thus prevented from running to their full capacity. The amount of current business which is coming in to the manufacturers is undoubtedly diminished somewhat by the fact that the larger buyers have already covered

their wants, and are not yet under the necessity of replenishing stock. Backwardness of the season in many parts of the country has also operated somewhat to repress trade. Notwithstanding these influences jobbers report an excellent demand and there is little reason for complaint. The business of the country is evidently going at the great pace which has kept up for some time, and the indications point to a very large and prosperous season's business.

NOTES ON PRICES.

Porcelain Enameled Bathtubs.—The Standard Sanitary Mfg. Company of Pittsburgh are about to issue new list prices on all Porcelain Enameled Bathtubs. It is understood that the new list prices will be considerably reduced from the prices which have heretofore prevailed, but there will be no reduction in the net selling prices of these goods. The Standard Sanitary Mfg. Company have always used the high lists, thereby giving the retail trade a better opportunity to reap greater profits than they would get on the Tubs made by other manufacturers and which are listed at lower prices. It is said that the new prices will be so arranged that the jobbing trade, through which the products of this concern are marketed, will be able to give a much smaller discount than formerly. The new lists will probably be issued prior to April 10, but will be in effect on and after April 1.

Galvanized Range Boilers.—The meeting of the Galvanized Range Boiler manufacturers, which took place on the 25th inst., resulted in a postponement to the early part of April, subject to the call of a committee which has several important matters in hand. It is said that matters are being satisfactorily arranged and that in a short time the members of the association will have absolute control of the marketing of this class of goods.

Cast Iron Steam Fittings.—The manufacturers of Cast Iron Steam Fittings withdrew all quotations on March 26. The withdrawal of prices was unanimous on the part of all the manufacturers. New and higher prices will be quoted only upon application. The manufacturers have discontinued the sending of indiscriminate and unsolicited quotations.

Wire Nails.—The difficulty of getting prompt shipments on Wire Nails from mills continues. The manufacturers were behind with their orders before the recent floods, and the two weeks which were lost as a consequence of this interruption have been very much felt. From present indications there seems to be little hope of improvement in the situation for the next 30 days at least. With better weather the local demand for Wire Nails in the New York market shows improvement. Most of the jobbers' stocks are broken in assortment, owing to delayed shipments. The market is firm at $2.25 to $2.30 per keg for small lots of Wire Nails from store.

Cut Nails.—There is a fair demand for Cut Nails, with some difficulty in getting prompt shipments. Small lots from store, New York, are quoted at $2.25 per keg.

Window Glass.—It is quite generally believed that when the Jobbers' Association place another bulk order for Glass with the combined manufacturers the prices will be higher than when they made their last purchase. Reports are current to the effect that the Jobbers' Association will make another advance in prices during April. Meanwhile the association quote a discount of 95 and 50 per cent. from store.

Step Ladders.—An advance of 1 cent per foot has been made by manufacturers in the price of Step Ladders.

Linseed Oil.—The tone of the market for Linseed Oil is hardening and there is talk of a further advance at an early date. The demand for Oil is improving, City Raw in small lots being quoted at about 64 to 64½ cents per gallon, and out of town Raw at 63 to 63½ cents.

Spirits Turpentine.—The volume of buying is limited, consumers taking only such amount as will fill present requirements. Prices, however, have stiffened again, on the strength of short supplies at Southern points. Small lots of Turpentine are now quoted at 50½ to 51 cents per gallon.

TRADE NOTES.

The Chicago Furnace Supply Company of Chicago have been incorporated by F. W. Metz, A. E. Williams and D. A. Colbert with $15,000 capital to manufacture articles from iron, tin and sheet metal.

The Lennox Chemical Company, manufacturers of the Lennox Soldering Fluid, &c., are making substantial additions to their present plant on Willson avenue, Cleveland, Ohio.

The machinery has been installed in the new plant of the New Castle Stamping Company, at New Castle, Pa., and the factory is expected to be put in operation April 1.

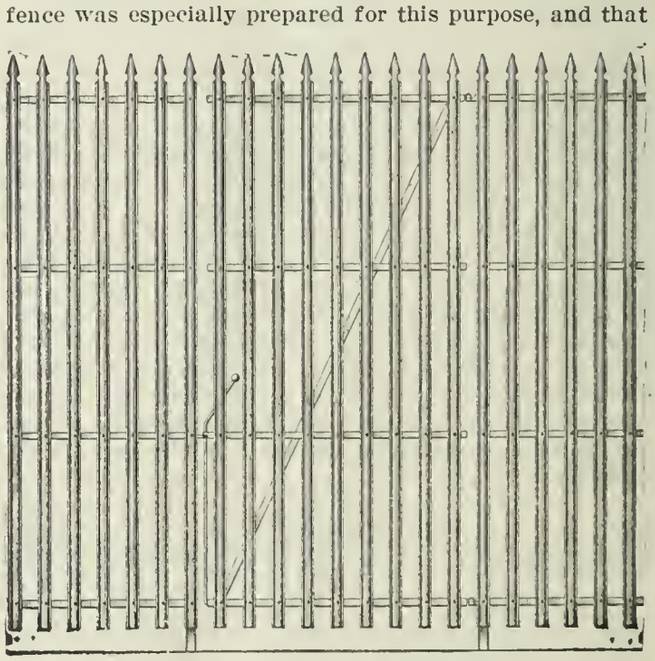
The report that the Pittsburgh Reduction Company of Pittsburgh, manufacturers of Aluminum, are planning to build a plant in East St. Louis, Mo., for the manufacture of Aluminum Wire, is untrue. This concern have no such plans under way at this time.

The Arkansas Slate Company of Mount Ida, Ark., have been incorporated with a capital stock of $250,000. Curtis Wright is president of the concern; W. R. Logan, vice-president, and William J. Wright, Jr., secretary and treasurer.

Frantz Hardware Company, Enid, O. T., wholesale and retail Hardware, Stove, Buggy and Wagon and Agricultural Implement merchants, expect soon to occupy their new establishment, and express a desire for catalogues of up to date Hardware Store Fixtures. They will also value catalogues, circulars, &c., pertaining to the general Hardware line.

The World's Fair Fence.

The fence shown herewith, manufactured by Mesker & Brother, St. Louis, Mo., will be used to inclose the park side of the Louisiana Purchase Exposition Grounds. The manufacturers state that this style and design of fence was especially prepared for this purpose, and that



The World's Fair Fence.

it was selected for its cheapness, durability and neat appearance. It is made entirely of steel pressed into its molded form, consisting of end, line and gate posts, rails, pickets and gates. The fence is now made in various hights suitable for residences, public parks and cemeteries.

In order to handle their rapidly growing galvanizing and tinning business the Malleable Iron Fittings Company, Branford, Conn., are obliged to again increase their capacity in this department, and have under consideration plans that call for a new building to contain

about 7000 square feet of floor space. The new plant will have its own power plant and shipping room, the power being required in the gray iron tinning department, and the building will be equipped throughout with overhead and surface tracks to facilitate the rapid and economical handling of work. In addition to their regular line of Galvanized and Black Malleable Iron, Steam, Water and Gas Fittings, which include everything in these goods known to the trade, they contract to manufacture for others hardware specialties of malleable iron, galvanized or tinned, and are manufacturers of Malleable, Steel and Semisteel Castings. Their plant being located at tidewater places them in exceptionally good position to manufacture goods at the minimum of cost.

Some Old Cement Recipes.

That old recipes must not be despised is evidenced on every hand, says the *Decorators' Gazette and Plumbers' Review* of London. Manufacturers frequently bemoan their inability to match an old varnish, color, cement or Roman mortar. We take the following recipes for glues and cements from a book published in 1755, and give them just as they stand:

A water cement, which the longer it is in water the harder it grows.—Take mastick, incense, rosin and fine cut cotton, of each an equal quantity, melt, and with some powdered quicklime mix them up into a mass.

A cement as hard as iron.—Melt pitch, then take ground sand, worn off from grind stones, stir them well together, boil it up and it is fit for use.

An excellent glue for wood, stone, glass and metals.—Take good glue, 4 ounces, soak it over night in distilled vinegar, then boil it up therewith; take a clove of garlick, beat or bray it in a mortar, add to it 1 ounce of ox gall. Wring this juice through a linen cloth into the warm glue; then take mastic and sarcacolla, of each 1 dram, sandarac and turpentine of each 2 drams; grind the sandarac aud mastic fine, and put them together with the sarcocolla aud turpentine into a vial; pour 1 ounce of the strongest brandy upon it, and let it stand three hours in a moderate heat, well stopped up, giving it now and then a shake; add this also to the warm glue; then stir or beat it together with a wooden spatula, till some of the moisture is evaporated and the glue is grown cold. When you have occasion to use it, then take as much or as little as your work requires, soak it iu strong vinegar till it is dissolved. If you use this glue for stones mix it with tripoli, or with some powdered chalk; and if for glass mix besides a little tripoli, fine ground Venice glass; aud if you would use it for metals, as iron, brass, copper, put to it some of the finest filings. You may also add a little isinglass. And if you would have this glue hold out or staud the water, mix it up with a strong varuish as much as the present occasion requires.

A good stone glue or cement for grotto work.—Take 2 parts of white rosin, melt it clear, add to it 4 parts of beeswax; when melted together, add stone flower, of the stone you design to cement, 2 or 3 parts, or so much as will give the cement the color of the stone; to this add 1 part of flower of sulphur; first incorporate all together over a gentle fire and afterward knead it with your hands in warm water. With this cement the stones after they are well dried and have been warmed before the fire, in order to receive the cement the better.

A wood glue which stands water.—Common glue mixed up with linseed oil or varnish, applied to the places to be glued together, after they have been warmed, and when thoroughly dry will last and stand water.

Another fine glue.—Take the isinglass and common glue, soak them over night in strong brandy; then dissolve them over a coal fire and mix with a little fine powdered chalk. This will make a very strong glue.

Another extraordinary glue.—Take sal ammoniac, sandarac aud gum lacca, soak and dissolve them in strong brandy, over a gentle heat, put to them a little turpentine; when all is dissolved, then pour the solution over isinglass and common glue, and in a close vessel dissolve it over a slow fire; add to it a little glass dust, and when it is of a right temper use it.

A good water cement.—Take 1 part of minium or red lead and 2 parts of lime; mix them well together with the whites of eggs.

Stone glue, wherewith you may glue either stone or glass.—Take white flintstone powder which is dry and finely searced; then take white rosin, melt it in an iron or earthen ladle, stir the powder in it till it is like a thick paste: warm the glass, or what you design to glue together, gild the places or joinings and it will add a great beauty. This has been made use of in the embellishment of cabinets and other things.

Improvement in the car service at the coke ovens and iron furnaces has been marked in the past week or ten days, owing to the more favorable weather conditions. It is to be expected that from now on affairs will rapidly assume better shape, as regards fuel supply and shipping facilities in the iron and steel industry, and the scarcity and congestion that have marked the past few weeks will gradually disappear.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED MARCH 28, 1902.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ D. 37¢
100-D lots.....₩ D. 35¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 Ds or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₩ D.	₩ D.	₩ D.
Nos. 18 to 19.....	$0.42	$0.44	$0.47
" 20.....	.44	.46	.49
" 21 to 23	.46	.48	.51
" 24.....	.48	.50	.53
" 25.....	.47	.51	.54
" 26.....	.47	.54	.59
" 27.....	.48	.57	.62
" 28.....	.48	.57	.54
" 29.....	.49	.60	.69
" 30.....	.50	.64	.77

Note.—Lots of less than 50 Ds 5¢ ₩ D extra.

Antimony—

Cookson.....₩ D. 10¼@10¾¢
Hallett's.....₩ D. 8¾@8¾¢
U. S.....₩ D 8½@8¾¢

Brass, Roll and Sheet..... 30%

Conductors—Corrugated.

Round or Square.—

Galvanized ½ or more. N'st'd.....70&5%
" Not Nested.....70&2½%
" Plain Round, ¼ or more.
Nested.....70&5%
Galvanized, Plain Round, Not Nested. 70&2½%

Spiral Riveted.

Galvanized.....40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—

See *Strainers, Conductor*

Copper—

Lake Ingot.....13¼@13¾¢
Casting.....13 @13¾¢
Sheet and Bolt.....18¢ ₩ D basis
Cold Rolled Sheets.....19¢ ₩ D basis
Cold Rolled and Polished Sheets ..... 20¢ basis
Planished Sheets.....21¢ basis
Bottoms, Pits and Flats....₩ D 22¢ basis

Eave Trough Galvanized

Territory.	L. C. L.
Eastern	75&10%
Central	75&7½%
Southern	70&12½%
S. Western	70&10%

Terms, 2% for cash.

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Eastern List.

Tin.....30%
Galvanized.....30%
Perfect Elbows.....40%

Stove Pipe—

Four-Piece

	4	4½	5	5½	6-inch.
No. 1.	$0.80	.85	.90	1.00	1.05 per doz.
No. 2.	.65	.70	.75	.80	.85 "
No. 3.	.60	.68	.65	.70	.80 "

Elbows and Shoes—

Galvanized.....60%

Gasoline—

See *Petroleum Products.*

Iron, Sheet—*Black.*

	One Pass, C. R., Soft Steel.	R. G. Cleaned.
Nos. 14 to 16....	₩ D. 3.50....	3.55¢
Nos. 18 to 21.....	₩ D. 3.60....	3.65¢
Nos. 22 to 24.....	₩ D. 3.70....	3.75¢
Nos. 25 and 26...	₩ D. 3.80....	3.85¢
No. 27	₩ D. 3.90....	3.95¢
No. 28	₩ D. 4.00....	4.05¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ D 11@14 ¢
Do. Stained.....6@10½¢
Patent Planished. ₩ D A, 11¢; B, 10¢ net

Galvanized.

Nos. 10 to 16.....₩ D, 12¢ } 70@70&2½% off
Nos. 17 to 21.....₩ D, 18¢ }
Nos. 22 to 24.....₩ D, 14¢ }
Nos. 25 to 26.....₩ D, 15¢ }
No. 27.....₩ D, 16¢ }
No. 28.....₩ D, 17¢ }
No. 29.....₩ D, 19¢ }
No. 30.....₩ D, 21¢ }

35 in. 1¢ ₩ D higher.

Lead—

American Pig.....4.45@4½¢
Bar.....5@5½¢
Pipe.....6½¢.....20% off
Tin Lined Pipe.....12½¢.....20% off
Block Tin Pipe.....35 ¢.....20% off
Sheet Lead.....7¼¢.....20% off
Old Lead in exchange, 3½¢ ₩ D.

Mitres Eave Trough—

See *Eave Trough Mitres.*

Nickel—

Per D.....55@60¢

Paints, Oils, &c.—

Leads—

Lead, American White, in Oil:
Lots of 500 D or over.....6¼ @ 5½
Lots less than 500 D.....6½ @ 6¾
Lead, White, in oil, 25 D tin pails, add to keg price..... @ ⅛
Lead, White, in oil, 12½ D tin pails, add to keg price..... @ 1
Lead, White, in oil, 1 to 5 D assorted tins, add to keg price. @ 1½
Lead, White, Dry in bbls.....5¾ @ 6
Lead, Red, bbls., ½ bbls. and kegs:
Lots 500 D or over..... @ 6
Lots less than 500 D ..... @ 6½

Oils—

Linseed, City, raw.....₩ gal..... 54¢
Linseed, City, boiled..... 56¢
Linseed State and West'n. raw..... 53¢

Spirits Turpentine—

In Southern bbls.....50½@51 ¢
In machine bbls.....51½@52 ¢

Putty—

In bulk.....$1.25
In bladders..... 2.25
In cans 12 D to 25 D..... 2.25
In cans 1 D to 5 D..... 3.25

Petroleum Products—

In Barrels (Barrel Included)

Stove Gasoline.....₩ gal. 10½@11¢
Kerosene.....₩ gal. 12@13¢

Pipe, Drain.....40%

Pipe, Spiral—

See *Conductors.*

Registers—

List Sept. 2, 1901.

Black Japanned.....60&10@60&10&5%
White Japanned.....60&10@60&10&5%
Nickel Plated.....60&10@60&10&5%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze..... 60&10@60&10&5%
Electroplated in Brass, Bronze or Copper.....60&10@60&10&5%
White Porcelain.....60%
Solid Brass and Bronze Metal.....50%

Roofing Material—

1 Ply Tarred Paper. ₩ ton.$30.00@31.00
2 Ply Tarred Paper...₩ roll, 108 sq. ft. 50@55¢
3 Ply Tarred Paper..₩ roll, 108 sq. ft. 70@75¢
Slater's Felt.....roll 500 sq. ft., 50@60¢
Roofing Pitch.....₩ bbl. $2.35

Rosin—

Common and Good—Strained.

Rosin, C. & D.....₩ bbl. $1.62½@1.55
Rosin, E. & F.....₩ bbl. 1.70 @ 1.75
Rosin, G. & H ....₩ bbl. 1.80 @ 1.82½
Rosin, I. & K .....₩ bbl. 2.02½@ 2.05
Rosin, M. & N.....₩ bbl. 3.00 @ 3.55

Shoes and Elbows—

See *Elbows and Shoes.*

Slate Roofing—

f. o. b. cars, Quarry Station.

	According to size.
Pennsylvania:	
Best Bangor, ₩ sqr.....	$3.25@$4.50
No. 1 Bangor Ribbon, ₩ sq	3.00@ 3.50
Pen Argyle, ₩ sqr.....	3.00@ 3.75
Peach Bottom, ₩ sqr.....	4.85@ 5.60
No. 1 Boys, ₩ sqr.....	3.35@ 3.55
No. 1 Chapman Keystone, ₩ sqr	3.25@ 4.25
Vermont:	
Sea Green, ₩ sqr.....	$2.00@$3.25
Purple, ₩ sqr.....	3.75@ 4.25
Unfading Green, ₩ sqr...	8.25@ 4.50
Red, ₩ sqr	7.00@11.00
Maine:	
Brownville, Unfading Black.	
No. 1 quality.....	$5.25@7.50
No. 2 quality.....	$4.25@6.00

Solder—

½&½ guaranteed..... 17½@18¢
No. 1.....15@16½¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

	Per Pound.—Barrels	Smaller Quantities
Concentrated Flux.....	4c	5c
Eureka Flux:		
Triple Strength.....	3c	3½c
Extra Concentrated.....	4½c	5c
Crystal.....	..	7c
Gedney's Fluid.....	2c	2c
Lennox Fluid.....	2c	3c
Perfection Flux.....	3c	3½@4c
Yager's Salts, 1 lb. bottles.....	each, 50¢	
5 lb. bottles, per lb., 45¢		

Soldering Coppers—

Per D.....20@22¢

Spelter—

Western Spelter.. .....4.60@4.70¢

Spiral Pipe—

See *Conductors.*

Stove Pipe Elbows—

See *Elbows, Stove Pipe.*

Stove Trucks—

See *Trucks, Stove.*

Strainers, Conductor—

Galvanized..... .....50%

Tin Pigs and Bars—

Banca, pigs, ₩ D..... .....27¼@28 ¢
Straits, pigs, ₩ D..... 27¼@28 ¢
Straits, in bars, ₩ D..... .....28¼@29 ¢

Tin Plates, American Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:		
IC,	14 x 20.....	$7.50
IX,	14 x 20.....	9.00
IXX,	14 x 20.....	10.25
IXXX,	14 x 20.....	11.50
IXXXX,	14 x 20.....	12.75
Melyn Grade:		
IC,	14 x 20.....	7.00
IX,	14 x 20.....	8.50
IXX,	14 x 20.....	9.75
IXXX,	14 x 20.....	11.00
IXXXX	14 x 20.....	12.25
Allaway Grade:		
IC,	14 x 20.....	6.50
IX,	14 x 20.....	7.60
IXX,	14 x 20.....	8.70
IXXX,	14 x 20.....	9.80
IXXXX,	14 x 20.....	10.90

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight } IC, 14 x 20.....$4.90@5.00
" " IX, 14 x 20.....$6.00

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 D.....15¢
95 D.....15¢
90 D.....15¢
85 D.....30¢

Terne Plates—

N. B.—The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance for 8 to 10 D coating and $2.50 to $3 advance for 15 D and upward.

About 40 D coating.. .....$16.00@16.50
About 30 D coating..... 15.25@15.75
About 20 D coating..... 13.25@13.75
About 15 D coating..... 11.25@11.75
About 8 D coating..... .....@10.00

Boiler Plates, American—

1XX, 14 x 26..(112 sheets)..... $12.50
IXX, 14 x 28..(112 sheets)..... 13.50
IXX, 14 x 31..(112 sheets)..... 15.00

Troughs, Eave—

See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubes and Tubing—

Brazed Brass, List June 6, 1898 .....40%
Copper and Bronze, 3c per lb. list more than Brass.
Seamless Brass Tubes, net list Feb. 6, 1899
Tin.....50%
Galvanized.....50%
Fittings for do.....40%

Zinc—

600 D casks ₩ D.....6¾¢
Per D.....7¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Boilers, Galvanized—

Standard Boilers:
30 gal.....70&10%
35 and 40 gal.....70%
Other sizes up to 52 gal....60@60&10%
52 gal. and above.....60%
Extra Heavy Boilers:
18 to 52 gal.....60%
53 gal. and above 55%

Brass Work, Plumbers'—

List of December 7, 1896.

Compression:
Basin Cocks.....65%
Bath Cocks and Double Bath Cocks.. 65%
Bibs.....65%
Bibs, Flanged.....65%
Fuller:
Bibs.....70%
Basin Cocks, Nos. 1 to 4.....70%
Bath Cocks, No. 4½.....$2.40 each net
Ground Key Work:
Finished Bibs.....55&5%
Rough Bibs.....70%
Rough Stop and Stop and Waste Cocks.....70@70&5%
Rough Stop and Stop and Waste Cocks, Patented.....65@65&5%

Miscellaneous—

Basin Clamps.....60@65%
Bssin Plugs.....60@65%
Chain Stays.....60&5@70%
Iron Boiler Couplings:

	Lead Pipe.	Iron Pipe.
Plain Face..₩ set	$0.95	$1.05
Ground Face ₩ set	$1.00	$1.10

Sink or Bath and Wash Tray Plugs.60@65%
Soldering Nipples.....70&5@75%
Soldering Unions.....70&5@75%
Union Elbows, Hot Water Heating.... 75@75&15%

Cocks, Valves, &c.—

Cocks—

Brass—

Air and Radiator Air .....75@75&5%
Gas Meter and Union Meter.....65@70%
Steam.....65@70%

Iron—

All Iron.....70@70&10%
Iron with Brass Plugs.....65@70%

Valves—

Brass—

Check.....65@70%
Garden Hose..... .....65&10@70%
Gate.....65@65&10%
Globe and Angle, hose ontlet.65@65&10%
Globe, Angle and Cross....65&10@70&5%
Horizontal, Vertical and Angle Check... 65@65&10%
Hot Water Radiator 75%
Radiator.....70&10%
Safety.....65%
Safety, Low Pressure.....65%
Jenkins' Disc:
Check.....65%
Gate.....65%
Globe, Angle and Cross.....70%
Radiator.....80%
Radiator, Corner.....75%
Safety.....65%

Iron—

Iron Body.....70@70&5%
Foot.....65@70%
Jenkins Bros.':
All Iron, except Gate.....40&5%
All Iron Gate.....35@40%
Iron Body, except Gate.....60%
Iron Body Gate..... .....50@50&5%
Swing Check..... .....50%

Earthenware—

Brown Glazed Wash Tubs..... .....20%
Brown Glazed Sinks, Kitchen and Pantry 20%
Basins, Urinals and Hoppers.....45%
Closet Bowls, Sundries, Washouts and Pedestals..... ....50%

Fittings—

Brass Fittings—

Finished.....70@75%
Rough .....70@75%
Bushings.....70@75%
Nipples.....70@70&2½%
Unions, Rough and Finished....70@70&5%

Iron—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....65@70%
Cast Iron Bushings and Plugs.....65@70%
Cast Iron Flanges.....65@70%
Cast Iron Floor Flanges.....65@70%
Malleable Iron Fittings (from D list).50%
" " Bushings..... 65@70%
" " Unions..... .....65@70%
" " Unions, Flange 60&10@70%
" " Pipe Hangers, Universal 70%
Wrought Iron Nipples.....65@70%
" " Couplings... .....60@65%
" " Long Screws.....60@65%

Lavatories—

Porcelain Enameled Iron.....80@80&10%

Oakum—

Plumbers' Oakum, 50 lb. bales, ₩ D 2½¢

Pipe—

Brass, Iron Pipe Size—

⅛	¼	⅜	¾ to 3 Inch
$0.38	.31	.29	.23 ₩ D

Cast Iron Soil—

List Feb. 25, 1901.
2 to 6 inch inclusive.

Standard..... 50&10%
Extra Heavy..... .....65%
All Fittings.....70%

Wrought Iron—

List Feb. 15, 1900.

	Black.	Galv
⅛ to ⅜ inch	55%	41%
½ to 12 inch	65%	50%

Radiators—

Standard List.

Steam.....50&2½%
Hot Water..... .....50%

Sinks, Etc.—Cast Iron—

	Black.	Galv.
Sinks, Square, Half Round and Corner	60@65%	60@65%
Sink Legs. 60%		60@65%
Sink Backs 60%		60@65%
Boiler Stands, Cast Iron	60@60&10%	
Cesspools, Cast Iron	60%	

Wrought Steel Sinks—

New Era, Galv'd and Enameled. ..70&5%
New Era, Painted.....50&10%
L. & G.....50%

Traps—

Drawn Lead Traps, List June 3, 1901..... 50&3%

Tubs, Bath—

Cast Iron Enameled Bath Tubs.
Regular Patterns, Guaranteed. 45@50%
All Special Patterns..... ...25%
Non-Guaranteed Brands, complete line .....45@50%
Solid Copper, list of Feb. 1, 1899.....40%
Solid Porcelain—Class A, 30%: B, 40%: C, 50%.
Steel Clad Copper Lined, list of Feb. 1, 1899.....50@55%

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Lightning Rods.
Washburns, E. G. & Co., 46 Cortlandt St., N. Y.

Lunch Boxes.
Seavey Mfg. Co., Boston, Mass.

Mail Boxes.
Signal Mail Box Co., Joliet, Ill.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Asheville Mica Co., Asheville, N. C.
Munsell, Eugene & Co., 218 Water St., New York.
Ohio Mica Co., Canton, Ohio.
Rutland Fire Clay Co., Rutland, Vt.

Milk Cans.
National Enameling & Stamping Co., 78 Beekman St., N. Y.

Oil Heaters. (*See Stoves and Ranges, Oil, Vapor and Gasoline.*)

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Patent Solicitors.
Hamlin, G. R., Washington, D. C.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Patterns.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Perforated Sheet Metal.
Harrington & King Perforating Co., Chicago, Ill.

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Pipe Cutting and Threading Machines.
Curtis & Curtis Co., Bridgeport, Ct.
Saunders, D. Sons, Yonkers, N. Y.

Pipe Hangers.
Iwan Bros., Streator, Ill.

Pipe Joint Cement.
Callahan, Geo. & Co., 218 Front Street, N. Y.

Pipe Vises.
Walworth Mfg. Co., Boston, Mass.

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Millar, C. & Son Co., Utica, N. Y.

Plumbers' Tools, Specialties and Supplies.
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Clayton & Lambert Mfg. Co., Detroit, Mich.
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National Pipe Bending Co., New Haven, Conn.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.
Walworth Mfg. Co., Boston, Mass.
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Young, Jos. H., Boston, Mass.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

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Anderson Coupling Co., Portland, Ct.

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Arcade Mfg. Co., Freeport, Ill.
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Troy Nickel Works, Troy, N. Y.

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Vogel, Wm. & Bros., 37 to 47 S. 9th St. Brooklyn, N. Y.

Press Work.
Kirk Mfg. Co., Toledo, O.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.

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Hess-Snyder Company, Massillon, Ohio.
Lawless, John H., Jersey City, N. J.

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Bliss, E. W. Co., Brooklyn, N. Y.
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Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.

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Koven, L. O. & Bro., 50 Cliff St., N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

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Cooper & McKee, Brooklyn, N. Y.
Gurney Refrigerator Co., Fond du Lac, Wis.

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Canton Steel Roofing Co., Canton, O.
Dighton Furnace Co., Taunton, Mass.
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Seavey Mfg. Co., Boston, Mass

Roofing, Asphalt.
Asphalt Ready Roofing Co., 136 Water St., N. Y.

Roofing Cement and Paint.
Asphalt Ready Roofing Co., 136 Water St., N. Y.
Callahan, Geo. & Co., 218 Front Street, N. Y.
Dixon, Jos. Crucible Co., Jersey City N. J.
Perkins, J. L. & Co., Chicago.
Rutland Fire Clay Co., Rutland, Vt.

Roofing Cork.
Stowell Mfg. Co., Jersey City, N. J.

Roofing Edger.
Danzer Metal Works, Hagerstown, Md.

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Burton, W. J. & Co., Detroit, Mich.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Gummey, McFarland & Co., Phila., Pa.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Reeves Mfg. Co., Canal Dover, O.

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Salem Nail Co., 279 Pearl St., N. Y

Roofing Slate.
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Bray, J. & Co., E. Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Genuine Bangor Slate Co., Easton, Pa.
Johnson, E. J. & Co., 38 Park Row, N. Y.
O'Halloran & Jacobs, Pittsburgh, Pa.

Sap Spouts.
Millar, C. & Son Co., Utica, N. Y

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International Correspondence Schools, Scranton, Pa.

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Harrington & King Perforating Co Chicago, Ill.

Sewer Pipe.
Rutland Fire Clay Co., Rutland, Vt

Shaped Iron and Steel, Galvanized.
Am. Galvanizing Wks., Chicago, Ill.

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Heartley Machine Variety Iron & Tool Works, Toledo, O.
McSherry, Chas., Pittsburgh, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

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Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y
Heartley Machine Variety Iron & Tool Works, Toledo, O.
Keene (Geo. C. & Co., Cincinnati, O.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Porcor, O., Cincinnati, O.
Poorman Mfg. Co., Piqua, O.
Robinson, J. M. Mfg. Co., Cincinnati, Ohio.
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Steel & Iron Aluminum Coating Co., Connellsville, Pa.

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American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
McClure & Co., Pittsburgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Alan Co., Philadelphia, Pa.

Sheets, Iron and Steel.
American Sheet Steel Co., New York.
Bruce & Cook, 186 to 190 Water St., N. Y.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Osborn, J. M. & L. A., Cleveland, O.
Wood Co., Alan, Philadelphia, Pa.

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Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Siding. *(See Roofing and Siding.)*

Skylights.
Canton Steel Roofing Co., Canton, O.
Dronve, G. Co., Bridgeport, Conn.
Mullins, W. H., Salem, O.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 279 Pearl St., N. Y.

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Clason Arch. Metal Works, Providence, R. I.

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McClure & Co., Pittsburgh, Pa.
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Taylor, N. & G. Co., Philadelphia, Pa.

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Ostrander, W. R. & Co., 204 Fulton St., N. Y.

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Curtis & Curtis Co., Bridgeport, Conn
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Cambridge Rolling Mill Co., Cambridge, Ohio.

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Schwerdtle Stamp Co., Bridgeport, Ct.

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Kirk Mfg. Co., Toledo, O.

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Rutland Fire Clay Co., Rutland, Vt.

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Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
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Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

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Nickel Plate Stove Polish Co., Chicago, Ill.
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Stove Patterns.
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Gobeille Pattern Co., Cleveland, O.
Milwaukee Pattern Works, Milwaukee, Wis.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
O. K. Mfg. Co, Buffalo, N. Y.

Stove Repairs.
Clark, Henry N. Co., Boston, Mass.
Heath, C. C. & Co., Phila., Pa.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.
Troy Nickel Works, Troy, N. Y.

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Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Arcade Mfg. Co., Freeport, Ill.

Stoves and Ranges.
Barstow Stove Co., Providence, R. I.
Beckwith, P. D., Est. of, Dowagiac Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Brand Stove Co Milwaukee, Wis.
Champion Steel Range Co., Cleveland, Ohio.
Dighton Furnace Co., Taunton, Mass
Eclipse Stove Co., Mansfield, O.
Enterprise Stove Co., Vincennes, Ind.
Floyd, Wells & Co., Royersford, Pa.
Fuller & Warren Co., Troy, N. Y.
Hess-Snyder Company, Massillon, O.
Joliet Stove Works, Joliet, Ill.
Magee Furnace Co., Boston, Mass.
Pittsburgh Stove & Range Co., Pittsburgh, Pa.
Quincy Fdry. & Novelty Co., Quincy, Ill.
Richmond Stove Co., Norwich, Conn.
Sheppard, Isaac A. & Co., Phila., Pa.
Smith & Anthony Co., Boston, Mass.
Somerset Stove Foundry Co., Somerset, Mass.
Stamford Foundry Co. Stamford, Ct.
Thatcher Furnace Co., 240 Water St., N. Y.
Weir Stove Co., Taunton, Mass

Stoves and Ranges, Gas.
Adler H. & Co., Pittsburgh, Pa.
Dighton Furnace Co., Taunton, Mass.
Metropolis Sheet Metals & Stove Repairing Co., Newark, N. J.

Stoves and Ranges, Oil, Vapor and Gasoline.
Heath, C. C. & Co., Philadelphia, Pa.

Street Lamps, Gasolene.
Merkel, H., St. Louis, Mo.

Tank Heaters.
American Radiator Co., Chicago, Ill.

Tanks, Steel and Wood.
Edwards, J. H., 59 Park Place, N. Y.

Terne Plates.
American Tin Plate Co., New York.
Taylor, N. & G. Co., Phila., Pa.

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Berger Bros. Co., Phila., Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn N. Y.
Weiss, H. & Co., 20 Cliff St., N. Y

Tinners' Trimmings.
Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate.
American Tin Plate Co., New York.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

Tin Scrap.
Vulcan Metal Refining Co., 157 Cedar St., N. Y.
Vulcan Western Co., Streator, Ill.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn
Curtis & Curtis Co., Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Torches, Plumbers.
Clayton & Lambert Mfg. Co., Detroit, Mich.

Tubing.
Kirk Mfg. Co., Toledo, O.

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Am. Steam Gage & Valve Mfg. Co., Boston, Mass.
Crosby Steam Gage & Valve Co., Boston, Mass.
Jenkins Bros., 71 John St., New York.
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Kramer Bros., Dayton, O.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Marston, I. G. & Co., Boston, Mass.

Washing Machines.
Wayne, Anthony Mfg. Co., Ft. Wayne, Ind.

Water Coolers.
National Enameling & Stamping Co., 78 Beekman St., N. Y

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Zero Valve & Brass Mfg. Co., Buffalo, N. Y.

Water Fronts.
Clark, Henry N. Co., Boston, Mass.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.
Miner & Peck Mfg. Co., New Haven, Ct.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Original letters of reference should not be inclosed with replies to advertisements appearing in these columns as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

The Campbell Furnace Company of Des Moines, Iowa, are looking for a good FURNACE SALESMAN to sell their furnaces direct from the manufacturers to the consumer. Mar. 29

A TINNER who understands plumbing, roofing, spouting, &c., done in a country shop. Chas. W. Shoupe, New Florence, Pa. Mar. 29

First-class SOLDER MAKER and SMELTER OF DROSSES. "D. R.," care *The Metal Worker,* New York. Mar. 29

ENAMELER; want to correspond with man who is compctent and thoroughly understands enameling on cast iron, such as bathtubs, and also sheet iron. "First-Class," care *The Metal Worker,* New York. Mar. 29

A first-class TINNER and GENERAL JOBBER; one that understands pumps and wind mills preferred; must be sober, honest and a quick, reliable worker; steady work; reference required. B. F. Rockhill, Columbus, N. J. Mar. 29

Six first-class TINNERS and CORNICE MAKERS; will pay $3 per day for nine hours' work; steady work for the right men. Duluth Corrugating & Roofing Company, Duluth, Minn. Mar. 29

By April 4, 1902, an all around TINNER for inside and outside work; must be a first-class mechanic; will give steady work to a good man; wages $2.60 to $3 per day of eight hours. Schnaufer Bros., 820 James street, Allegheny, Pa. Mar. 29

Reliable, energetic TINNER; good wages and steady work to the right party. J. E. Kuchler, 325 West Forsyth street, Jacksonville, Fla. Mar. 29

A first-class TINSMITH; sober and reliable; must have full knowledge of furnace and sheet metal work; capable of managing men; a year round position for right one if a hustler and union man. Apply in person. W. H. Sniffin, 17 Railroad avenue, White Plains, N. Y. Mar. 29

Competent FOREMAN for plumbing, piping and tin working shop employing 10 to 20 men (established 60 years); must be capable of laying out work and estimating on contracts in above lines; also steam and hot water heating, and must be able to give good references as to character, habits and ability; a steady position assured at fair salary to the right man; applicants will please write, giving age, qualifications and previous experience, to the Hull Bros., Danbury, Conn. Mar. 29

A PLUMBER, STEAM and HOT WATER FITTER; must understand tin and sheet iron work; good wages to the right man; send references. C. B. Jacobs & Son, Hollidaysburg, Pa. Mar. 29

Young, hustling TINSMITH; must be able to do a fair job on in and outside work; a steady job to the right man; state wages wanted and experience. W. Pahland, 415 Richmond Terrace, New Brighton, Staten Island. Mar. 29

PLUMBERS; all around men accustomed to tin work, wind mills, &c.; steady job to right party. M. Garland, Seabright, N. J. Mar. 29

STOVE SALESMAN for States of Iowa and Illinois; must be able to command trade. "B. S.," care *The Metal Worker,* New York. Mar. 29

A first-class man in a large cornice and skylight shop who is fully capable of getting out patterns, taking sizes and managing men; one who can estimate preferred; to a competent man the highest wages will be paid; only first-class, sober men need apply. "Hustler," care *The Metal Worker,* New York. Mar. 29

Several good SHEET IRON WORKERS as road mechanics; those used to blow pipe work preferred; state age, wages expected and where last employed. The Ohio Blow Pipe Company, corner Seneca and Michigan streets, Cleveland, Ohio. Mar. 29

At once, a first-class TINNER and SLATE ROOFER; must be a good, all around mechanic; steady job the year through for good man; answer at once, stating wages, age and experience. H. Von Blon, Upper Sandusky, Ohio. Mar. 29

A first-class PLUMBER; a steady job to the right man. Barrett Hardware Company, Joliet, Ill. Mar. 29

At once, one good PLUMBER and one good TINNER; good job; steady the year round. W. E. Frye, Marion, Ohio. Mar. 29

A first-class TINSMITH; sober and reliable; none other need apply. D. E. McNally & Co., 199 Union street, Worcester, Mass. Mar. 29

SHEET IRON MECHANICS who have a knowledge of erecting blow piping; apply, stating age, if married or not, what experience you have had in this line of work and whom you have worked for, and what wages you expect for steady work if you prove satisfactory; we have always had steady work for good men in this line. Apply to Box 428, Hartford, Conn. Mar. 15

FOREMAN for furnace tin shop employing 20 men; must have experience and furnish references. "K.," care *The Metal Worker,* New York. Mar. 15

A good TINNER who understands his business for steady job the year around; send references and state wages, &c. F. L. Roy, Darlington, Wis. Mar. 22

Two good all around TINNERS and SLATERS; steady work the year round. J. B. Crowl, Alliance, Ohio. Mar. 22

Three SALESMEN, familiar with hot air furnaces, to sell our heaters in New York and vicinity. Uzal Cory & Co., 210 Water street, New York. Mar. 22

FOREMAN for roofing and corrugating works who has had experience in making all kinds iron roofing, figuring plans and specifications, and making estimates from blue prints. "Roofing," care *The Metal Worker,* New York. Mar. 22

A first-class TINSMITH; preference to man who can do plumbing and plumbing repairs; steady job to sober, industrious man; state age, experience and wages expected. Acer & Whedon, Medina, N. Y. Mar. 22

All around TINSMITH; one that understands plumbing, steam heating and pump work; steady work for right man; state wages expected and give references. J. P. Browneli, Riverside, R. I. Mar. 22

A first-class PLUMBER who understands general jobbing in country town and can do plain tinning; steady work for right party; must come at once. Chas. A. Wheeler, Southport, Conn. Mar. 22

Two first-class PLUMBERS; must be strictly sober and reliable; reference required. George E. Bauer, Port Washington, L. I., N. Y. Mar. 22

Three TINNERS for inside and outside work; must be able to make tinware, sheet iron work, spouting, roofing, &c., and all work that is generally done in a tinshop; state experience and salary expected; a steady job for right parties. Box 115, Frostburg, Md. Mar. 22

Two strictly first-class BLOW PIPE MEN; none but good men need apply. Savannah Blow Pipe & Exhaust Works, Savannah, Ga. Mar. 22

One first-class TINSMITH and ROOFER eight-hour day; good wages to right man. Apply to C. S. McLean & Co., Utica, N. Y. Mar. 15

SITUATIONS WANTED.

By a FURNACEMAN of 20 years' experience superintending and estimating and as salesman; would like a position by May 1: 18 years with a large house in Boston. "G. M.," 11 Allen street, Boston, Mass. Mar. 29

If you are in need of a first-class, all around man at PLUMBING, TINNING and HEATING I would be pleased to correspond with you. E. Tuttle, General Delivery, Milford, Mass. Mar. 29

By a young man, 33 years of age, first-class PLUMBER and GAS FITTER; 18 years' experience in New York City; can figure from and read plans; as journeyman or take charge; licensed and registered by New York Board of Health and Department of Public Works; go anywhere; state age and full particulars. P. H. Becker, 1980 Daly avenue, New York. Mar. 29

Experienced PLUMBER; city or country; wages moderate. "P.," care *The Metal Worker,* New York. Mar. 29

By young man (25), single, with 13 years' experience as tin and sheet iron worker, plumbing, steam and gas fitting, furnace, piping, pumps and ranges; strictly sober and reliable; steady job, wages $2.50 per day. Alfred B. Elwell, 46 Bamforth avenue, Danbury, Conn. Mar. 29

By a TINSMITH and SHEET IRON WORKER, understanding furnace and general work. "K. S.," 470 Shonnard street, New York. Mar. 29

By an all-around TINNER; steady job; inside and outside work; heating, general jobbing and some knowledge of plumbing. Chas. Shields, General Delivery, Cleveland, Ohio. Mar. 29

As FOREMAN and ESTIMATOR, by an experienced and thoroughly up to date man in cornice and skylight work; high class work; capable of handling large number of men; unquestionable references; Philadelphia preferred. "S. A. E.," care *The Metal Worker,* New York. Mar. 29

A youth (18) who is willing and handy with tools and who has had experience in the cornice trade wishes to get into some good cornice shop where he can finish the trade. In care of P. W. Quenl, Station E, Brooklyn, N. Y. Mar. 29

FOREMAN desires to change; thorough mechanic; competent to figure and detail from drawing cornice and skylight work; well versed on job work, tin, sheet iron and hot air; shop of 8 to 15 men preferred, town of 30,000 to 80,000. "G. S. H.," Station G, Lock Box 496, Washington, D. C. Mar. 29

PLUMBER and PIPE FITTER; first-class mechanic, steady and sober; can give the best references as to character, habits, &c.; city or country. Wm. Golding, Jr., 235 West Thirty-eighth street, New York. Mar. 29

By a first-class PLUMBER; strictly sober, willing, A1 on all new work and overhauling; quick and neat on lead work, sewerage and ventilation; can do any work from plans or take charge of shop or job; best of reference; 14 years' experience; figure and contract on work. "Plumber," care housekeeper, 421 West Thirty-second street, New York. Mar. 29

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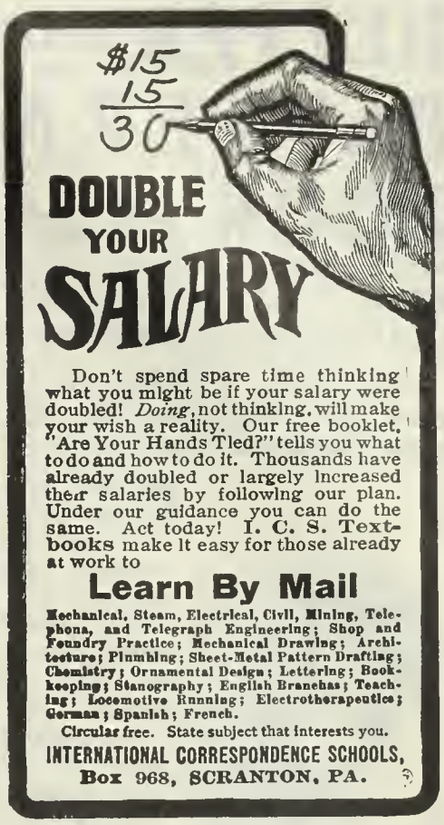
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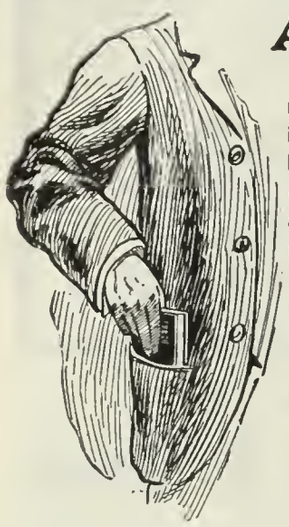
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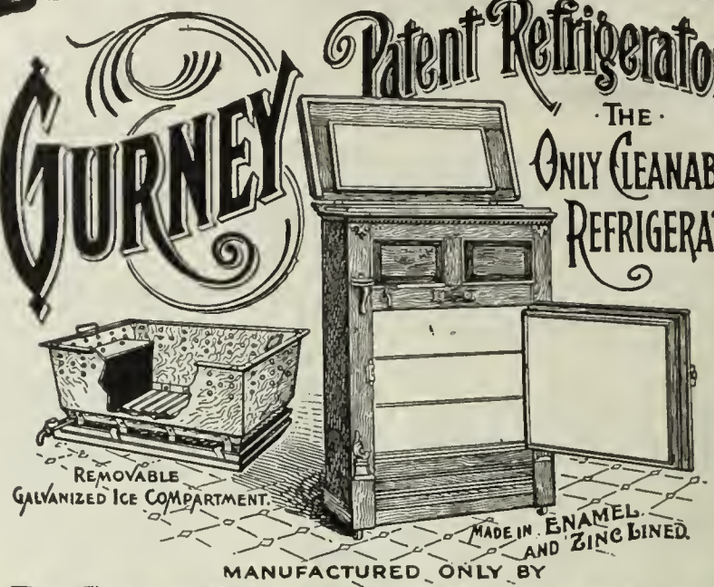
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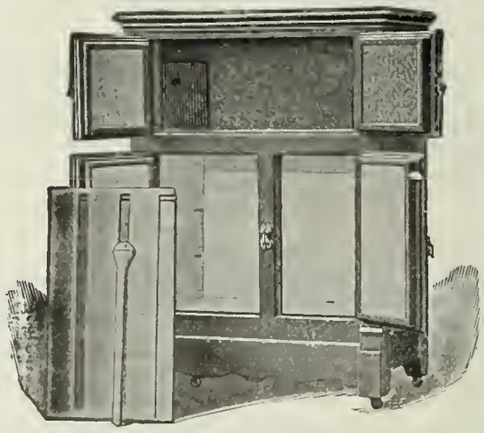
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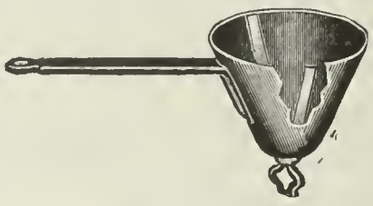


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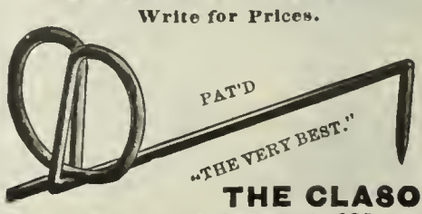


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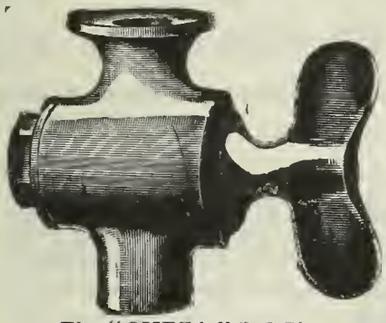
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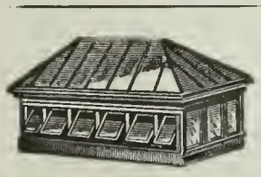
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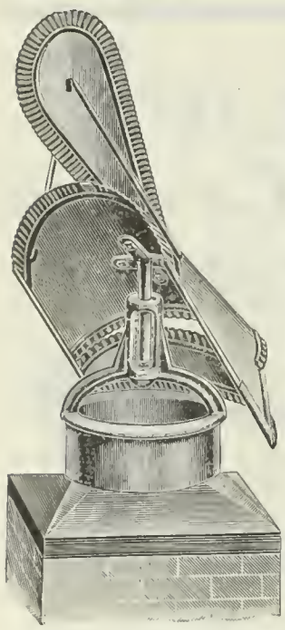
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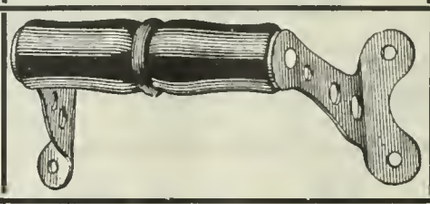
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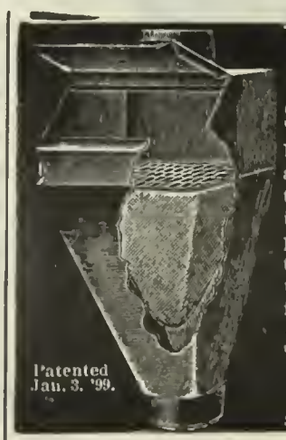
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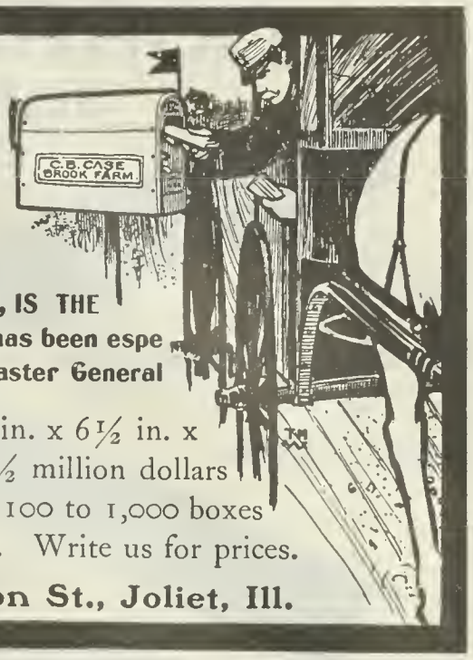
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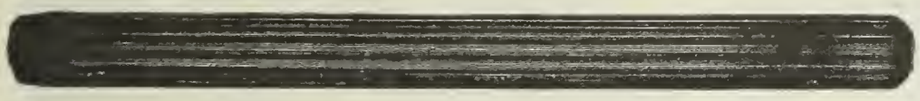
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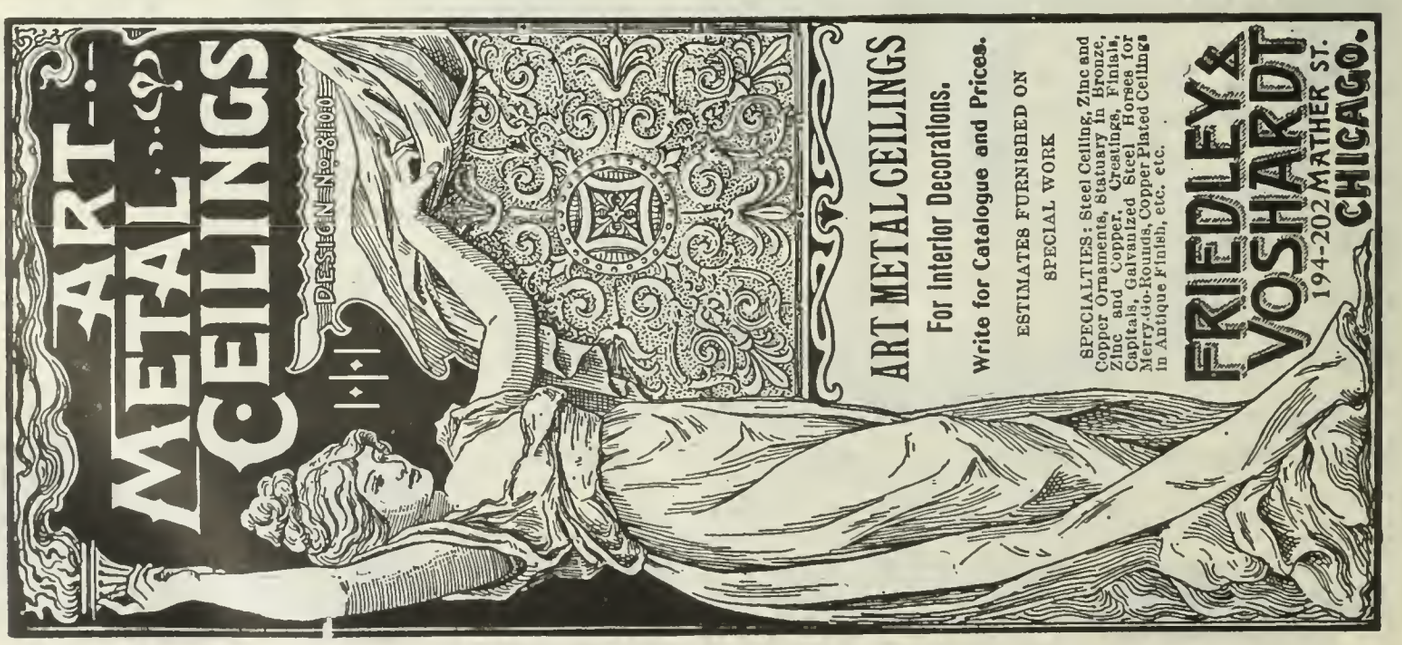
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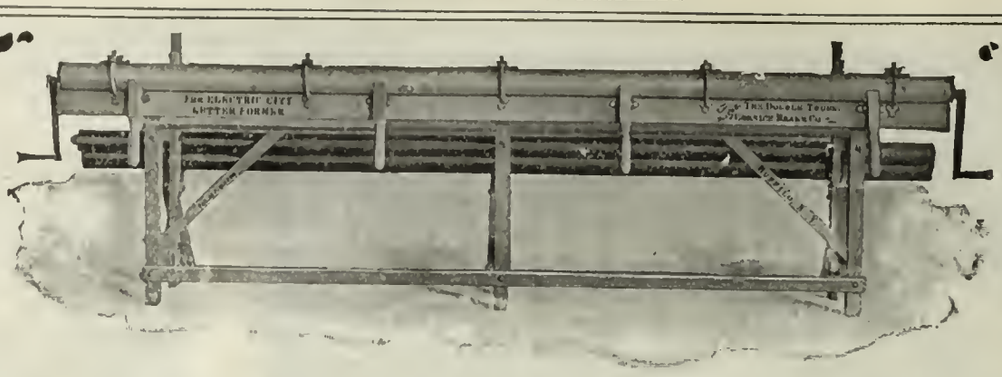
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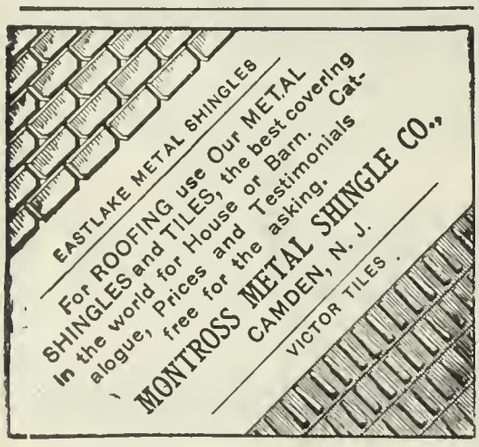
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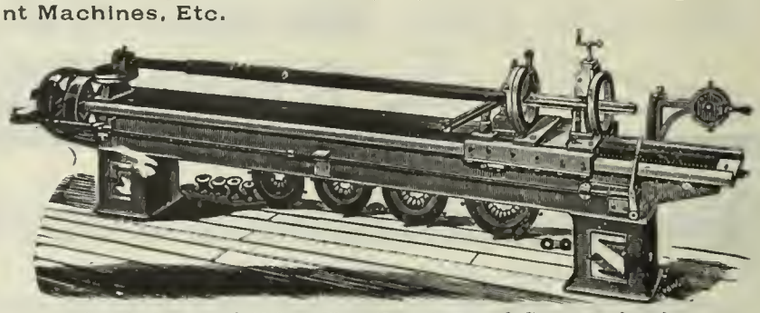




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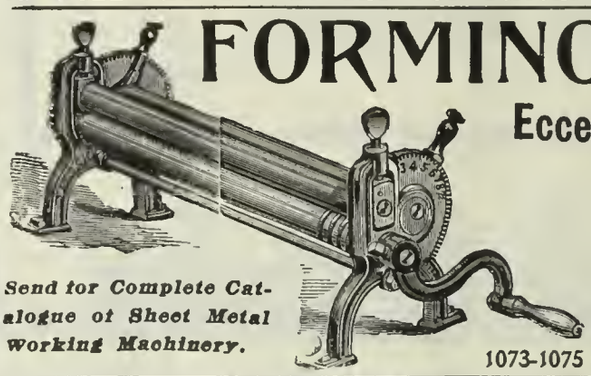


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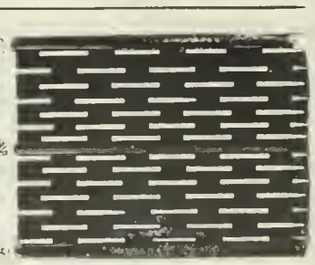
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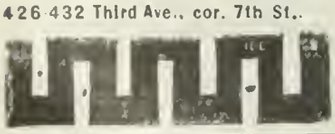
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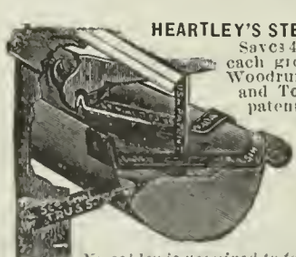
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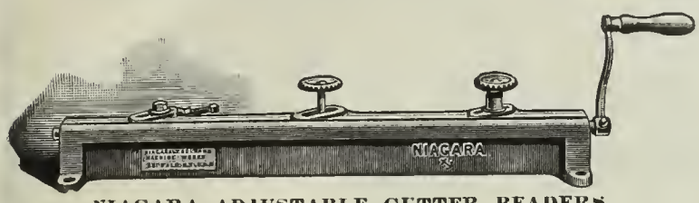
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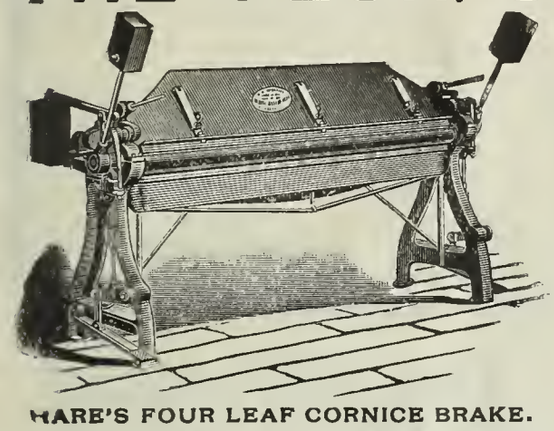
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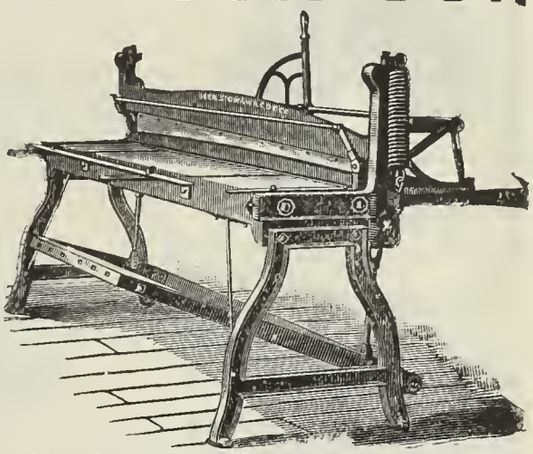
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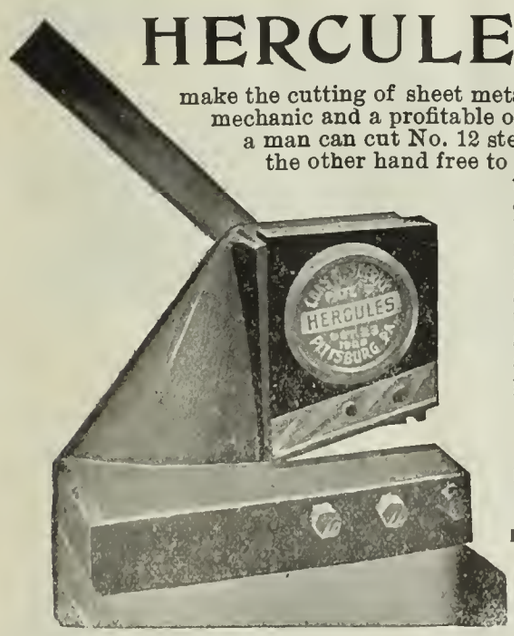


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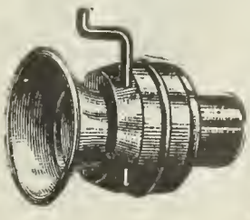
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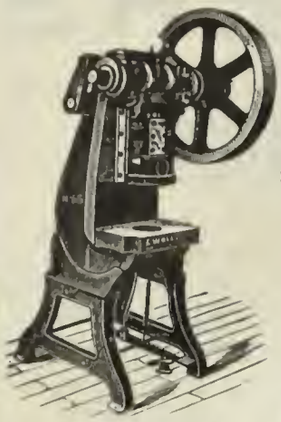


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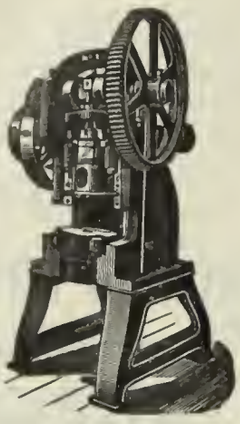
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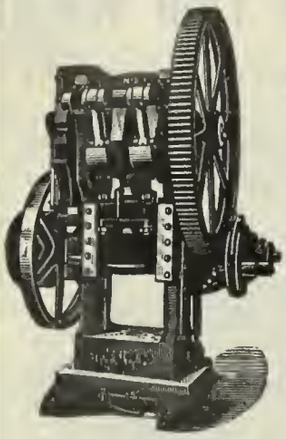
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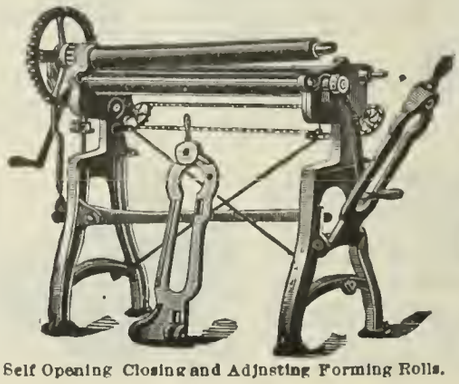


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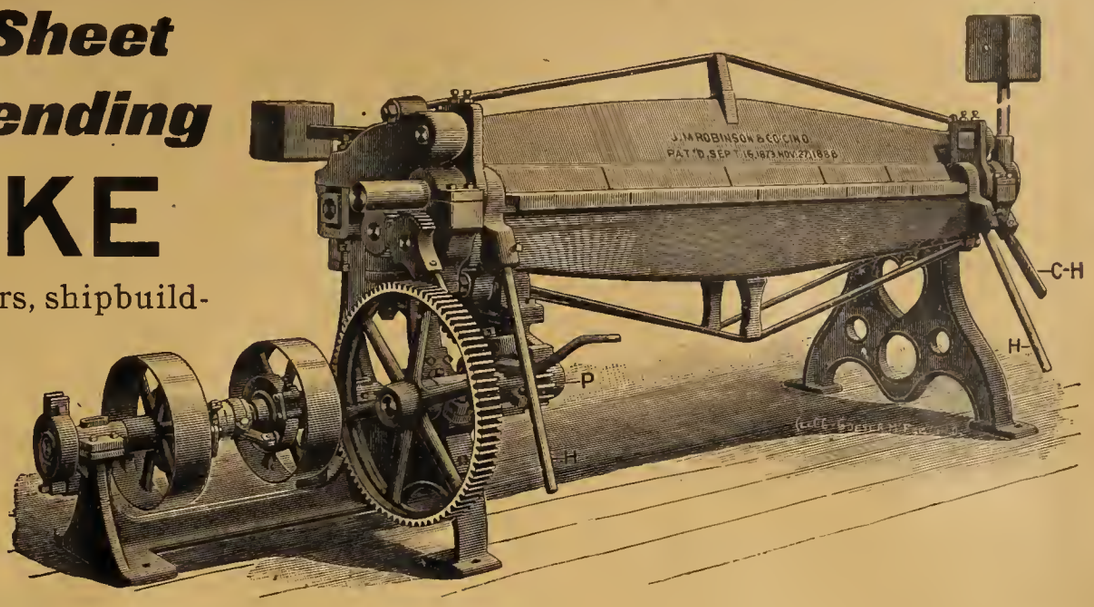
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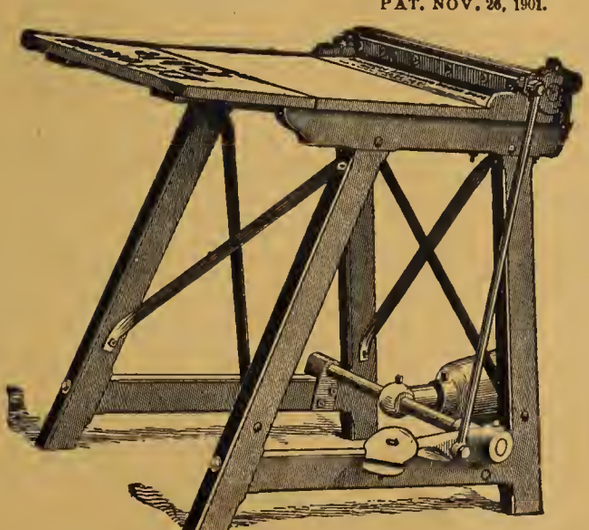
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Numbskull: "Go ahead."

Alex Smart: "If the earth makes one revolution in 24 hours, how many revolutions does South America make in a week?"—*Columbus (Ohio) State Journal.*

— "Gingham," added the missionary, "is as cheap as dirt!"

"But is it as cool?" objected the savage young person, for she still hesitated.—*Detroit Free Press.*

— Mrs. G.'s Hope.—Mr. Griffin: "Our butcher says there's no money in turkey."

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